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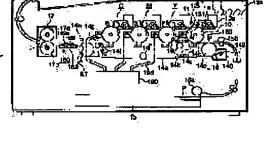
SHIGETA KUNIO

(54) COLOR IMAGE FORMING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To recycle black color toner that has the highest frequency of use by carrying out recycling of the toner by installing the image forming unit of the black color in the most upstream position in the direction of rotation of an intermediate transfer body and carrying out recycling of the toner and at the same time, installing the image forming units of yellow, magenta, and cyan in downstream positions.

SOLUTION: In this color image forming device, the toner remaining inside a cleaning device 19 of the black color (K) image forming unit 100 installed most upstream in the rotating direction of the intermediate transfer belt 14a is ejected by a screw 19c from the cleaning device 19, carried to a developing device 13 of the black color (K) again through a carrying pipe 19d and recycled. The toner inside the cleaning device 19 provided for each image forming unit 100 for yellow(Y), magenta(M), and cyan(C) are ejected from the cleaning device 19 by the



screw 19c, carried to a toner recovering container 190 through carrying pipes 19d and recovered to within the toner recovering container 190.

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CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS

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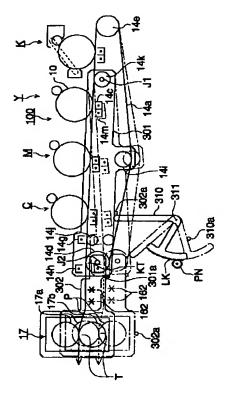
CLAIMS

[Claim(s)]

[Claim 1] In the color picture formation equipment which lays the toner image which has yellow, a Magenta, cyanogen, and each black image formation unit, and was formed of each aforementioned image formation unit one by one on top of belt-like a middle imprint object or imprint material Color picture formation equipment characterized by arranging yellow, a Magenta, and the image formation unit of cyanogen in a down-stream position, and collecting toners while arranging a black image formation unit in the hand-of-cut best style position of the aforementioned middle imprint object and recycling a toner.

[Claim 2] It has yellow, a Magenta, cyanogen, and each black image formation unit. In the color picture formation equipment established with a fixing means in the account toner image of back to front which laid the toner image formed of each aforementioned image formation unit one by one on top of belt-like a middle imprint object or imprint material Color picture formation equipment characterized by changing the position of the imprint material guidance means to the aforementioned fixing means, or the aforementioned fixing means into yellow, a Magenta, and the image formation unit of cyanogen with movement of the aforementioned middle imprint object contact or whose alienation was enabled at the time of the image formation by the black toner. [Claim 3] Color picture formation equipment according to claim 1 or 2 characterized by forming a double-sided picture in the aforementioned imprint material through the aforementioned middle imprint object.

Drawing selection [Representative drawing]



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JAPANESE [JP,2000-206755,A]
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DETAILED DESCRIPTION

[Detailed Description of the Invention] [0001]

[The technical field to which invention belongs] this invention relates to the color picture formation equipment of the electrophotography method which is made to pile up each other's color toner image formed on two or more image supports, and forms a color picture. [0002]

[Description of the Prior Art] It sets to a double-sided copy conventionally, and the picture and the timing which imprinted the picture of a field on imprint material, were established, once contained this to double-sided reversal feeding equipment, and were again formed on the image support double, it feeds with imprint material from double-sided reversal feeding equipment, and the method which imprints the picture of the field of another side and is established on imprint material is taken. [it was formed on the image support]

[0003] Since conveyance of imprint material, such as letting feed to double-sided reversal feeding equipment and fixing equipment pass twice like the above, was performed, this double-sided copy equipment had the low reliability of imprint material conveyance, and had become the cause which causes a jam etc. By JP,49-37538,B, JP,54-28740,B, JP,1-44457,A, JP,4-214576,A, etc., on the other hand, after forming a toner image in both sides of imprint material, What is established at once is proposed. to JP,1-44457,A or JP,4-214576,A, especially An image support, The image formation means which consists of an electrification means, an image exposure means, a development means, a cleaning means, etc. is arranged in parallel on two or more set middle imprint object in order of yellow (Y), a Magenta (M), cyanogen (C), and black (K), and the method of forming the double-sided copy of a color picture is proposed. [0004]

[Problem(s) to be Solved by the Invention] However, the double-sided color picture formation by the above-mentioned proposal Arrange many image formation meanses around a belt-like middle imprint object in order of yellow (Y), a Magenta (M), cyanogen (C), and black (K), and on a belt-like middle imprint object, one color, although image formation is performed in piles, a color toner image at a time The toner on a middle imprint object carries out a re-imprint (adhesion) to an image support at the following image formation process, and the toner of other colors carries out color mixture, and cannot adopt recycling of only a black toner as the black toner which operating frequency tends to recycle highly, either. Moreover, especially, at the time of a jam, the toner of other colors on a middle imprint object adheres to an image support, and the problem of causing color mixture arises.

[0005] This arranges an image formation means in parallel on two or more set middle imprint object in order of yellow (Y), a Magenta (M), cyanogen (C), and black (K). Color picture formation equipment and yellow (Y) which convey imprint material on a middle imprint object, pile up a toner image one by one and form a color toner image on imprint material, After arranging an image formation means in parallel on two or more set middle imprint object in order of a

Magenta (M), cyanogen (C), and black (K) and piling up a toner image one by one on a middle imprint object, a problem with the same said of the color picture formation equipment which imprints on imprint material collectively and forms a color toner image arises.

[0006] It aims at offering the color picture formation equipment which this invention solves the above-mentioned trouble, enables recycling of a black toner with the highest operating frequency, and enables recycling of a black toner with the highest operating frequency especially at the time of a jam.

[0007]

[Means for Solving the Problem] In the color picture formation equipment which lays the toner image which the above-mentioned purpose has yellow, a Magenta, cyanogen, and each black image formation unit, and was formed of each aforementioned image formation unit one by one on top of belt-like a middle imprint object or imprint material While arranging a black image formation unit in the hand-of-cut best style position of the aforementioned middle imprint object and recycling a toner It is attained by the color picture formation equipment characterized by arranging yellow, a Magenta, and the image formation unit of cyanogen in a down-stream position, and collecting toners (1st invention).

[0008] Moreover, the above-mentioned purpose has yellow, a Magenta, cyanogen, and each black image formation unit. In the color picture formation equipment established with a fixing means in the account toner image of back to front which laid the toner image formed of each aforementioned image formation unit one by one on top of belt-like a middle imprint object or imprint material It follows on movement of the aforementioned middle imprint object contact or whose alienation was enabled at yellow, the Magenta, and the image formation unit of cyanogen at the time of the image formation by the black toner. It is attained by the color picture formation equipment characterized by changing the position of the imprint material guidance means to the aforementioned fixing means, or the aforementioned fixing means (2nd invention). [0009]

[Embodiments of the Invention] Hereafter, the gestalt of operation of this invention is explained. In addition, the publication of this column limits neither the technical range of a claim, nor a terminological meaning. Moreover, the decision-explanation in the gestalt of the following operations of this invention does not show the best mode, and does not limit a terminological meaning or the terminological technical range of this invention. In addition, in explanation of the following operation gestalten, the field of the imprint material of the side which counters a front face and the field of another side of imprint material, i.e., a middle imprint object, in the field of the imprint material of the side which counters an image support in an imprint region is called rear face, and the picture imprinted by the rear face of a surface picture and imprint material in the picture imprinted by the front face of imprint material is called rear-face picture. [0010] The image formation process of 1 operation gestalt of the color picture formation equipment in connection with this invention and each mechanism are explained using drawing 1 or drawing 4. Drawing 1 is the cross-section block diagram showing 1 operation gestalt of the color picture formation equipment in connection with this invention. drawing 2 It is drawing showing the toner image formation state in the color picture formation equipment in connection with this invention. drawing 2 (A) It is drawing showing the toner image formation state when imprinting the rear-face picture formed in the image support on a middle imprint object. drawing 2 (B) It is drawing showing the toner image formation state when forming a surface picture in an image support synchronizing with the rear-face picture on a middle imprint object. drawing 2 (C) It is drawing showing the double-sided image formation to an imprint material top, and drawing 3 is drawing showing movement of alienation and the fixing means of a middle imprint object, and an imprint material guidance means, and drawing 4 is drawing showing other examples of movement of an imprint material guidance means.

[0011] The photo conductor drum whose 10 is an image support for every color in <u>drawing 1</u>, the scorotron electrification machine whose 11 is an electrification means for every color, The

exposure optical system whose 12 is a picture write-in means for every color, the development counter whose 13 is a development means for every color, The middle imprint belt whose 14a is a middle imprint object, the imprint machine whose 14c is an imprint means for every color, The rear-face imprint machine whose 14g is a rear-face picture imprint means, the electric discharge machine whose 14m is an electric discharge means, The paper electrification machine whose 150 is an imprint material electrification means, the paper separation AC electric discharge machine whose 14h is an imprint material separation means, the conveyance section which has the spur 162 whose 160 is an imprint material guidance means, and 17 are fixing equipment which is fixing meanses.

[0012] In this operation gestalt The cleaning equipment 19 which is the photo conductor drum 10 which is an image support for every color, the scorotron electrification machine 11 which is an electrification means for every color, the exposure optical system 12 which is a picture write-in means for every color, the development counter 13 which is a development means for every color, and a photo conductor drum cleaning means for every color The image formation unit 100 is constituted using these as 1 set. Black (K), As opposed to the hand of cut of middle imprint belt 14a which rotates to the counterclockwise rotation which forms yellow (Y), a Magenta (M), and 4 sets of image formation units 100 for every color of cyanogen (C), and shows them by the arrow of drawing 1 according to the color and sequence to form Black (K) is arranged in order of yellow (Y), a Magenta (M), and cyanogen (C) following the best style. You may arrange the image formation unit 100 of Y, M, and C in order of C, M, and Y. [0013] The photo conductor drum 10 which is an image support forms photosensitive layers, such as a conductive layer, an a-Si layer, or an organic photosensitive layer (OPC), in the periphery of the metal base of the shape of a cylinder formed for example, of aluminum material, and rotates to the clockwise rotation shown by the arrow of <u>drawing 1</u> where a conductive layer is grounded.

[0014] By the control grid held at predetermined potential, respectively, the toner by the corona discharge electrode, and the corona discharge of like-pole nature, the scorotron electrification machine 11 which is an electrification means performs the electrization (it sets in this operation gestalt and is minus electrification), and gives uniform potential to the photo conductor drum 10. As a corona discharge electrode of the scorotron electrification machine 11, it is also possible to, use a serrate electrode and a needlelike electrode in addition to this.

[0015] The exposure optical system 12 which is a picture write—in means is arranged around the photo conductor drum 10, as the exposure position on the photo conductor drum 10 is located in the hand—of—cut downstream of the photo conductor drum 10 to the scorotron electrification machine 11 for every color mentioned above. The exposure optical system 12 is a unit for exposure which consists of optical convergence nature optical—transmission objects (tradename : selfoc—lens array) as the exposure element and image formation element of the line which arranged two or more Light Emitting Diodes (light emitting diode) as the drum shaft of the photo conductor drum 10, and a light emitting device of the image exposure light arranged by parallel at main scanning direction in the shape of an array. It is also possible to, use a laser beam study system in addition to this as exposure optical system 12. The exposure optical system 12 for every color carries out image exposure of the photosensitive layer of the photo conductor drum 10 according to the image data of each color which was read by the picture reader of another object and was memorized by memory, and forms an electrostatic latent image on the photo conductor drum 10 for every color.

[0016] The development counter 13 which is a development means maintains a predetermined gap to the peripheral surface of the photo conductor drum 10. The thickness of 0.5–1mm rotated to the hand of cut and the forward direction of the photo conductor drum 10, It had the development sleeve 131 formed by the nonmagnetic stainless steel or the nonmagnetic aluminum material of the shape of a cylinder with an outer diameter of 15–25mm, and one component or two component developer of yellow (Y), a Magenta (M), cyanogen (C), and black

(K) is held in the interior according to the development color for every color. Un-illustrating dashes a development counter 13, it opens the photo conductor drum 10 and a predetermined gap, for example, 100–500 micrometers, by the koro, is maintained at non-contact, by impressing the development bias which superimposed direct current voltage and alternating voltage to the development sleeve 131, performs non-contact reversal development and forms a toner image on the photo conductor drum 10. Toner feed hopper 13a is prepared in the development counter 13 for every color, and the developer of the color which followed the development color of a development counter 13 from toner feed hopper 13a is supplied. It dissociates with a development counter 13, toner feed hopper 13a for every color is prepared in the equipment upper part (upper right of the color picture formation equipment of drawing 1), without preparing toner feed hopper 13a as a development counter 13 and one, and it may be made to supply a developer.

[0017] A volume resistivity is the endless belt of 109 - 1012 ohm-cm preferably 108 to 1016 ohm-cm, for example, middle imprint belt 14a which is a middle imprint object is the seamless belt of the two-layer composition which performed fluorine coating with a thickness of 5-50 micrometers on the outside of a half-conductivity film base with a thickness of 0.1-1.0mm which distributed the electrical conducting material to engineering plastics, such as a denaturation polyimide, a heat-curing polyimide, an ethylene tetrafluoroethylene copolymer, a polyvinylidene fluoride, and a nylon alloy, as a toner filming If it considers as the base of middle imprint belt 14a, a half-conductivity rubber belt with a thickness of 0.5-2.0mm which distributed the electrical conducting material can also be used for silicone rubber or polyurethane rubber. middle imprint belt 14a -- respectively -- a roller -- drive roller 14d and ground roller 14j which are a member, and a belt -- alienation -- it is laid [firmly] across axis-of-rotation roller 14k, follower roller 14e, and tension roller 14i, and rotates to the counterclockwise rotation shown by the arrow of drawing 1 follower roller 14e, ground roller 14j, and a belt -- alienation -- fixing and rotating axis-of-rotation roller 14k and drive roller 14d, tension roller 14i is supported by elasticity, such as a non-illustrated spring, possible [movement], and rotates It rotates, and drive roller 14d drives middle imprint belt 14a, and makes it rotate in response to a drive [drive motor / non-illustrated]. rotation of middle imprint belt 14a -- ground roller 14j and a belt -alienation -- axis-of-rotation roller 14k, follower roller 14e, and tension roller 14i follow and rotate The belt slack of middle imprint belt 14a under rotation becomes it tense by tension roller 14i. a belt -- alienation -- axis-of-rotation roller 14k is prepared between the position of the image formation unit 100 of K arranged in the hand-of-cut best style position of middle imprint belt 14a, and image formation unit 100 position of the following Y The recording paper P which is imprint material is supplied to the position where middle imprint belt 14a is laid [firmly] across follower roller 14e, and it is conveyed by middle imprint belt 14a. In the curvature section KT of the edge by the side of the fixing equipment 17 of middle imprint belt 14a laid by drive roller 14d, the recording paper P is separated from middle imprint belt 14a. [0018] The image formation unit 100 for every color is arranged in the outside (on <u>drawing 1</u>) of

middle imprint belt 14a which is the above-mentioned middle imprint object, and middle imprint belt 14a is minded. Counter with drive roller 14d and 14h of paper separation AC electric discharge machines which are an imprint material separation means Counter with ground roller 14j and 14g of rear-face imprint machines which are a rear-face picture imprint means Moreover, counter with follower roller 14e and the middle imprint belt cleaning equipment 140 which is a middle imprint object cleaning means is formed. Moreover, on both sides of middle imprint belt 14a, it counters with the photo conductor drum 10 of the image formation unit 100 for every color, it arranges to imprint machine 14c and this imprint machine 14c which are an imprint means for every color, and 14m of electric discharge machines which are the electric discharge means of a middle imprint object is formed.

[0019] Imprint machine 14c which is an imprint means for every color is a corona discharge machine which counters the photo conductor drum 10 for every color, and is formed on both

sides of middle imprint belt 14a, and forms imprint region 14b for every color between middle imprint belt 14a and the photo conductor drum 10 for every color. Polar (it sets in this operation gestalt and is plus polarity) direct current voltage opposite to a toner is impressed to imprint machine 14c for every color, and the toner image on the photo conductor drum 10 for every color is imprinted by forming imprint electric field in imprint region 14b on a middle imprint belt 14a top or the front face of imprint material.

[0020] It is preferably constituted by the corona-discharge machine, it is prepared in ground roller 14j prepared between imprint machine 14c and drive roller 14d on both sides of middle imprint belt 14a face to face, polar (it sets in this operation gestalt and is plus polarity) direct current voltage opposite to a toner is impressed, and 14g of rear-face imprint machines which are a rear-face picture imprint means imprints the toner image on middle imprint belt 14a at the rear face of the recording paper P.

[0021] 14m of electric discharge machines which are an electric discharge means for every color is constituted by the corona discharge machine. To the move direction of middle imprint belt 14a if needed to the downstream of imprint machine 14c which is an imprint means for every color It stands in a row with imprint machine 14c for every color, and it is prepared, the alternating voltage which superimposed the direct current voltage of a toner, like-pole nature, or reversed polarity is impressed, and the charge of middle imprint belt 14a in which an electric charge is carried out by voltage impression of imprint machine 14c is discharged.

[0022] It is preferably constituted by the serrate electrode, and it counters with follower roller 14e grounded on both sides of middle imprint belt 14a, and is prepared, and the direct current voltage of a toner and like-pole nature (it sets in this operation gestalt and is minus polarity) is impressed, the paper electrification machine 150 which is an imprint material electrification means is charged, and middle imprint belt 14a is made to adsorb the recording paper P in it. It is also possible to use the paper electrification brush in which the contact and contact release to a corona discharge machine or middle imprint belt 14a other than a serrate electrode are possible, a paper electrification roller, etc. as a paper electrification machine 150.

[0023] 14h of paper separation AC electric discharge machines which are an imprint material separation means is preferably constituted by the corona discharge machine. Counter drive roller 14d grounded by the fixing equipment 17 side-edge section of middle imprint belt 14a on both sides of middle imprint belt 14a if needed, and it is prepared. The alternating voltage which superimposed the direct current voltage of a toner, like-pole nature, or reversed polarity if needed is impressed, the recording paper P conveyed by middle imprint belt 14a is discharged, and it dissociates from middle imprint belt 14a.

[0024] The conveyance section 160 has the spur 162 which is an imprint material guidance means, and is prepared between the curvature section KT of the edge by the side of the fixing equipment 17 of middle imprint belt 14a, and fixing equipment 17. The conveyance section 160 prevents that, and become or a toner fixes on middle imprint belt 14a with the heat from fixing equipment 17 that the toner image supported by middle imprint belt 14a becomes with some weld, and it is hard to imprint. [that middle imprint belt 14a deforms]

[0025] The spur 162 which is an imprint material guidance means has two or more height 162a in a peripheral surface, and is prepared free [rotation] centering on the rotation support shaft 165. A spur 162 guides the rear—face side of the recording paper P, conveys the recording paper P, fixing the penetration direction to the fixing equipment 17 of the recording paper P, is stabilized and conveys the recording paper P to fixing equipment 17 while it prevents disorder of the rear—face toner image of the recording paper P which has a toner image to both sides.

[0026] The fixing equipment 17 which is a fixing means is established in the toner image on the recording paper P which has the nip section T conveyed by consisting of fixing members of the two shape of a roller of fixing roller 17a and sticking—by—pressure roller 17b which have a heater inside, carrying out pinching conveyance of the recording paper P in the nip section T between fixing roller 17a and sticking—by—pressure roller 17b, and adding heat and a pressure.

[0027] Next, an image formation process is explained.

[0028] By starting of the photo conductor drive motor which is not illustrated by the start of image recording, the photo conductor drum 10 of the image formation unit 100 of the black (K) arranged in the hand-of-cut best style position of middle imprint belt 14a rotates to the clockwise rotation shown by the arrow of <u>drawing 1</u>, and grant of potential is simultaneously started by the photo conductor drum 10 of K by the electrization of the scorotron electrification machine 11 of K.

[0029] After potential is given to the photo conductor drum 10 of K, the picture writing by the 1st chrominance signal, i.e., the electrical signal corresponding to the image data of K, is started by the exposure optical system 12 of K, and it has an electrostatic latent image corresponding to the picture of K of a manuscript picture formed in the front face of the photo conductor drum 10 of K.

[0030] Reversal development of the aforementioned latent image is carried out in the non-contact state by the development counter 13 of K, and a black (K) toner image is formed according to rotation of the photo conductor drum 10 of K.

[0031] The toner image of K used as the rear-face picture formed of the above-mentioned image formation process on the photo conductor drum 10 of K which is an image support is imprinted by imprint machine 14c of K which is an imprint means in imprint region 14b of K on middle imprint belt 14a which is a middle imprint object. Moreover, the charge of middle imprint belt 14a in which the electric charge was carried out by imprint machine 14c of K is discharged with 14vessels of electric discharge machines of K.

[0032] Subsequently, the toner image of K and a synchronization are taken and, as for middle imprint belt 14a, potential is given by the image formation unit 100 of yellow (Y) by the electrization of the scorotron electrification machine 11 of Y. The picture writing by the 2nd chrominance signal, i.e., the electrical signal corresponding to the image data of Y, is performed by the exposure optical system 12 of Y. Of imprint machine 14c of Y whose toner image of Y used as the rear–face picture formed on the photo conductor drum 10 of Y of the non–contact reversal development by the development counter 13 of Y is an imprint means in imprint region 14b of Y, the toner image of the upper shell Y of the toner image of the aforementioned K piles up, and is formed. Moreover, the charge of middle imprint belt 14a in which the electric charge was carried out by imprint machine 14c of Y is discharged with 14vessels of electric discharge machines of Y.

[0033] According to the same process, the superposition toner image of K and Y and a synchronization are taken. The toner image of M used as the rear-face picture corresponding to the image data of M by the 3rd chrominance signal formed on the photo conductor drum 10 of M of the image formation unit 100 of a Magenta (M) sets to imprint region 14b of M. Of imprint machine 14c of M which is an imprint means, the toner image of the upper shell M of the aforementioned K and the toner image of Y piles up, and is formed. Furthermore the superposition toner image of K, Y, and M and the synchronization were taken, and were formed on the photo conductor drum 10 of C of the image formation unit 100 of cyanogen (C). The toner image of C used as the rear-face picture used as the rear-face picture corresponding to the image data of C by the 4th chrominance signal sets to imprint region 14b of C. Of imprint machine 14c of C which is an imprint means, the toner image of the upper shell C of the aforementioned toner image of K, Y, and M piles up, and is formed, and the superposition color toner image of K, Y, M, and C of a rear-face picture is formed on middle imprint belt 14a. Moreover, the charge of middle imprint belt 14a in which the electric charge was carried out by imprint machine 14c of M and C is discharged with 14vessels of electric discharge machines of M and C. (Drawing 2 (A)).

[0034] Although the toner which remained on the peripheral surface of the photo conductor drum 10 for every color after an imprint is cleaned by cleaning-blade 19a which consists of the rubber material which resulted in the cleaning equipment 19 as a photo conductor drum cleaning

means, and contacted the photo conductor drum 10 The toner which collected in the cleaning equipment 19 of the image formation unit 100 of the black (K) arranged in the hand-of-cut best style position of middle imprint belt 14a is discharged by screw 19c from cleaning equipment 19. For example, through conveyance pipe 19d which connotes the rotating spiral spring and conveys a toner, it is conveyed again to the development counter 13 of K, and is recycled (reuse). It is arranged at the downstream of the black (K) image formation unit 100, the toner image supported on middle imprint belt 14a may carry out a re-imprint (adhesion) to the photo conductor drum 10 at the following image formation process, and reuse can be impossible easily. The toner in the cleaning equipment 19 formed in yellow (Y), a Magenta (M), and each image formation unit 100 of cyanogen (C) is discharged by screw 19c from cleaning equipment 19. For example, it is conveyed to the container 190 for toner recycling through conveyance pipe 19d which connotes the rotating spiral spring and conveys a toner, and is collected in the container 190 for toner recycling. It becomes recyclable [a black toner], without the toner of other colors carrying out color mixture to the black toner which operating frequency tends to recycle highly by this.

[0035] After the superposition color toner image which turns into a rear-face picture on middle imprint belt 14a as mentioned above is formed, the synchronization with the color toner image of the rear-face picture currently succeedingly supported by middle imprint belt 14a is taken, and the toner image of K which turns into a surface picture of K by the image formation unit 100 of K is formed on the photo conductor drum 10 of K like the above-mentioned color picture formation process. Under the present circumstances, image data is changed so that the surface picture of K formed on the photo conductor drum 10 of K may turn into a mirror image to the rear-face picture formed on the photo conductor drum 10 of Above K.

[0036] In connection with the surface image formation of K to the photo conductor drum 10 top of K, from the feed cassette 15 whose recording paper P which is imprint material is an imprint material receipt means It is sent out by send roller 15a and conveyed to timing roller 15b as an imprint material feed means. by the drive of timing roller 15b The synchronization with the toner image of the surface picture of K supported on the photo conductor drum 10 of K and the color toner image of the rear–face picture currently supported by middle imprint belt 14a is taken, and imprint region 14b of K is fed. Under the present circumstances, paper electrification is carried out at a toner and like–pole nature, middle imprint belt 14a is adsorbed by the paper electrification machine 150 serrate in the nose of cam where it considered as the contact state and the direct current voltage of a toner and like–pole nature (it sets in this operation gestalt and is minus polarity) was impressed to the recording paper P, and imprint region 14b of K is fed with the recording paper P with it (drawing 2 (B)). By performing paper electrification to a toner and like–pole nature, it prevented paying well with the toner image on middle imprint belt 14a, or the toner image on the photo conductor drum 10 of K, and disorder of a toner image is prevented.

[0037] In imprint region 14b of K, the surface picture on the photo conductor drum 10 of K is imprinted by imprint machine 14c of K as an imprint means by which polar (it sets in this operation gestalt and is plus polarity) voltage opposite to a toner was impressed, on the front face of the recording paper P. At this time, the rear-face picture on middle imprint belt 14a exists on middle imprint belt 14a without the recording paper's P imprinting. Moreover, the charge of middle imprint belt 14a in which the electric charge was carried out by imprint machine 14c of K is discharged with 14vessels of electric discharge machines of K.
[0038] Similarly the synchronization with the color toner image of a rear-face picture and the toner image of the surface picture of K which are supported by middle imprint belt 14a is taken. The toner image of the surface picture of Y, M, and C is formed on the photo conductor drum 10 of the image formation unit 100 of Y, M, and C. The toner image of the surface picture of Y, M, and C by each imprint machine 14c as an imprint means by which polar (it sets in this operation gestalt and is plus polarity) voltage opposite to a toner was impressed by imprint

region 14b of Y, M, and C Y on each photo conductor drum 10, The color toner image of the surface picture of M and C is imprinted one by one by the front face of the recording paper P in order of Y, M, and C. Moreover, the charge of middle imprint belt 14a in which the electric charge was carried out by imprint machine 14c of Y, M, and C is discharged with 14vessels of electric discharge machines of Y, M, and C. At this time, the rear-face picture on middle imprint belt 14a exists on middle imprint belt 14a without the recording paper's P imprinting. Under the present circumstances, with having mentioned above, similarly, image data is changed so that the surface picture of Y, M, and C which are formed on the photo conductor drum 10 of Y, M, and C may become with a mirror image to the rear-face picture formed on the photo conductor drum 10 of Above Y, M, and C, respectively.

[0039] The recording paper P with which the color toner image was imprinted by the front face is conveyed at 14g of rear-face imprint machines as a rear-face picture imprint means by which polar (it sets in this operation gestalt and is plus polarity) voltage opposite to a toner was impressed, and the color toner image of the rear-face picture on the peripheral surface of middle imprint belt 14a bundles it up with 14vessels of rear-face imprint machines, and it is imprinted by the rear face of the recording paper P (drawing 2 (C)).

[0040] The recording paper P with which the color toner image was formed in both sides By the curvature of the curvature section KT of middle imprint belt 14a, and the electric discharge operation with 14h of paper separation AC electric discharge machines as an imprint material separation means prepared in the edge of middle imprint belt 14a if needed Dissociate from middle imprint belt 14a, and it is conveyed through the spur 162 prepared in the conveyance section 160 to the fixing equipment 17 as a fixing means. It is fixed to the toner image on the recording paper P by conveying between the nip sections T between fixing roller 17a and sticking—by—pressure roller 17b, and being able to add heat and a pressure in the nip section T. The recording paper P with which double—sided image recording was made has the front reverse side reversed, is sent, and is discharged with the delivery roller 18 to the tray of the equipment exterior.

[0041] The toner which remained on the peripheral surface of middle imprint belt 14a after an imprint is countered and formed in follower roller 14e on both sides of middle imprint belt 14a, and is cleaned by the middle imprint object cleaning equipment 140 which is a middle imprint object cleaning means have the middle imprint object cleaning blade 141 in which contact and contact release are possible in middle imprint belt 14a by using a pivot 142 as the rotation supporting point.

[0042] Moreover, cleaning equipment 19 removes a remains toner, the history of the photo conductor drum 10 in previous image formation is canceled by the uniform photographic filter before non-illustrated electrification, and the toner which remained on the peripheral surface of the photo conductor drum 10 for every color after an imprint is in the following image formation cycle. As mentioned above, the toner which collected in the cleaning equipment 19 of the image formation unit 100 of the black (K) arranged in the hand-of-cut best style position of middle imprint belt 14a is conveyed again to the development counter 13 of K, and is recycled (reuse). It is arranged at the downstream of the black (K) image formation unit 100, the toner image supported on middle imprint belt 14a may carry out a re-imprint (adhesion) to the photo conductor drum 10 at the following image formation process, and reuse can be impossible easily. The toner in the cleaning equipment 19 formed in yellow (Y), a Magenta (M), and each image formation unit 100 of cyanogen (C) is conveyed to the container 190 for toner recycling, and are collected in the container 190 for toner recycling.

[0043] It becomes recyclable [the black toner which is not conspicuous even if it is prevented by the above that the black toner on a middle imprint object adheres to the image support of other colors, operating frequency is high and it carries out color mixture most by it]. It becomes recyclable [the black toner which is not conspicuous even if it is prevented that the black toner on a middle imprint object adheres to the image support of other colors especially

at the time of a jam, operating frequency is high and it carries out color mixture most]. [0044] Of course, also do single-sided image formation which forms a picture at one side of only the front face of imprint material, or a rear face out of the double-sided image formation which forms a picture in both sides of imprint material which was explained with the above-mentioned operation gestalt with above color picture formation equipment.

[0045] It can rotate focusing on the medial axis J1 of axis-of-rotation roller 14k. moreover, the belt with which middle imprint belt 14a is inscribed in the support plate 301 of both sides according to drawing 3 — alienation — It is arranged in the hand-of-cut best style position of middle imprint belt 14a. The downstream of the black (K) image formation unit 100 in which toner recycling is possible, The photo conductor drum 10 of the image formation unit 100 of Y, M, and C, and Y which counters, Drive roller 14d which lays 14m of electric discharge machines and 14g of rear-face imprint machines of imprint machine 14c of M and C, and Y, M and C, 14h of paper separation AC electric discharge machines, and middle imprint belt 14a, the belt of ground roller 14j, tension roller 14i, and the support-plate 301 center of rotation — alienation — axis-of-rotation roller 14k etc. is attached in a support plate 301 Moreover, the support plate 302 of both sides can be rotated focusing on the drive roller 14d medial axis J2, and the spur 162 and the fixing equipment 17 which are an imprint material guidance means are attached in a support plate 302.

[0046] the time of the monochrome image formation by the black (K) toner — a belt — alienation — a support plate 301 is rotated focusing on the medial axis J1 of axis—of—rotation roller 14k, the support plate 301 which has middle imprint belt 14a is moved, and middle imprint belt 14a is made to estrange from yellow (Y), a Magenta (M), and the image formation unit 100 of cyanogen (C)

[0047] The rack LK in which the lever 310 which holds a support plate 301 in the state where it was dashed against stopper 302a which engaged with the bottom edge of a support plate 301 in the end, and was prepared in it at the support plate 301 was formed by the other end By rotation of Pinion PN which connects on this rack LK, for example, rotates through non-illustrated a control section and a drive motor at the time of selection of monochrome image formation from a non-illustrated control unit A lever 310 rotates centering on the fixed shaft 311 in an alternate long and short dash line **** position from the position shown in drawing 3 as a solid line. It rotates. the alternate long and short dash line **** position from a position which a support plate 301 shows to drawing 3 as a solid line in connection with this -a belt -- alienation -- until it contacts stopper 310a by using the medial axis J1 of axis-of-rotation roller 14k as the supporting point In the state [that middle imprint belt 14a is in contact with the image formation unit 100 of K], it is estranged from the image formation unit 100 of Y, M, and C. Under the present circumstances, in order to guarantee penetration of the recording paper P to fixing equipment 17, while the support plate 302 currently stopped and held by stopper 301a prepared in the support plate 301 rotates the drive roller 14d medial axis J2 as a center with movement which is drive roller 14d, it is caudad moved to the position stopped in stopper 302a. A spur 162 and fixing equipment 17 are caudad moved with movement of a support plate 302 (repositioning). The recording paper P is guided by the spur 162 caudad moved as a dotted line showed to drawing 3, and it is fixed to the toner image on the recording paper P by being conveyed to the fixing equipment 17 moved caudad, conveying between the nip sections T between fixing roller 17a and sticking-by-pressure roller 17b, and being able to add heat and a pressure in the nip section T.

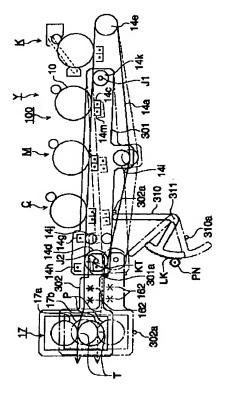
[0048] Moreover, as shown in <u>drawing 4</u>, the spur 162 which is an imprint material guidance means is attached. The support plate 303 which can rotate is formed focusing on the drive roller 14d medial axis J2. In order to guarantee penetration of the recording paper P to fixing equipment 17 with movement (movement in the alternate long and short dash line **** position shown in drawing 4 as a solid line from a position) in the lower part of the support plate 301 which has middle imprint belt 14a, The support plate 303 of the both sides currently stopped

and held by stopper 301a prepared in the support plate 301 with movement of drive roller 14d It is possible to also make it incline and move to the position stopped in stopper 303a, making an alternate long and short dash line **** position rotate the drive roller 14d medial axis J2 as a center from the position shown in <u>drawing 4</u> as a solid line. With movement of a support plate 303, a spur 162 inclines and it is moved caudad (repositioning). It is fixed to the toner image on the recording paper P by the recording paper's P being guided by the spur 162 arranged by inclining as a dotted line shows to <u>drawing 4</u>, conveying it to fixing equipment 17, conveying between the nip sections T between fixing roller 17a and sticking-by-pressure roller 17b, and being able to add heat and a pressure in the nip section T.

[0049] It becomes recyclable [the black toner which is not conspicuous even if it is prevented by the above that the black toner on a middle imprint object adheres to the image support of other colors, operating frequency is high and it carries out color mixture most by it]. It becomes recyclable [the black toner which is not conspicuous even if it is prevented that the black toner on a middle imprint object adheres to the image support of other colors especially at the time of a jam, operating frequency is high and it carries out color mixture most]. [0050] The composition explained by above-mentioned drawing 2 or drawing 4 Yellow (Y), a Magenta (M), An image formation means is arranged in parallel on two or more set middle imprint object in order of cyanogen (C) and black (K). Color picture formation equipment and yellow (Y) which convey imprint material on a middle imprint object, pile up a toner image one by one and form a color toner image on imprint material, An image formation means is arranged in parallel on two or more set middle imprint object in order of a Magenta (M), cyanogen (C), and black (K). It is possible to suppose that it is the same also about the color picture formation equipment which imprints on imprint material collectively and forms a color toner image, after piling up a toner image one by one on a middle imprint object, it becomes recyclable [the black toner which is not conspicuous even if it is prevented that the black toner on the same effect, i.e., the Nakama imprint object, adheres to the image support of other colors, operating frequency is high and it carries out color mixture to this having mentioned above most] It becomes recyclable [the black toner which is not conspicuous even if it is prevented that the black toner on a middle imprint object adheres to the image support of other colors especially at the time of a jam, operating frequency is high and it carries out color mixture most]. [0051]

[Effect of the Invention] According to this invention, it becomes recyclable [the black toner which is not conspicuous even if it is prevented that the black toner on a middle imprint object adheres to the image support of other colors, operating frequency is high and it carries out color mixture most]. It becomes recyclable [the black toner which is not conspicuous even if it is prevented that the black toner on a middle imprint object adheres to the image support of other colors especially at the time of a jam, operating frequency is high and it carries out color mixture most].

Drawing selection [Representative drawing]



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[Translation done]

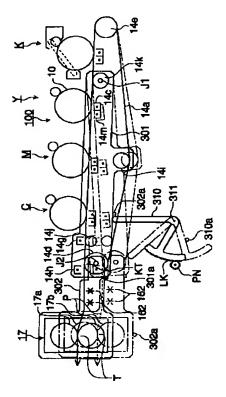
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TECHNICAL FIELD

[The technical field to which invention belongs] this invention relates to the color picture formation equipment of the electrophotography method which is made to pile up each other's color toner image formed on two or more image supports, and forms a color picture.

Drawing selection [Representativ drawing]



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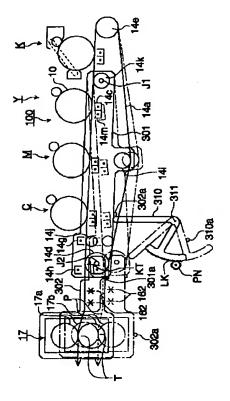
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PRIOR ART

[Description of the Prior Art] It sets to a double-sided copy conventionally, and the picture and the timing which imprinted the picture of a field on imprint material, were established, once contained this to double-sided reversal feeding equipment, and were again formed on the image support are doubled, it feeds with imprint material from double-sided reversal feeding equipment, and the method which imprints the picture of the field of another side and is established on imprint material is taken. [it was formed on the image support] [0003] Since conveyance of imprint material, such as letting feed to double-sided reversal feeding equipment and fixing equipment pass twice like the above, was performed, this double-sided copy equipment had the low reliability of imprint material conveyance, and had become the cause which causes a jam etc. On the other hand, it is yellow (Y) about the image formation means which what is established at once after forming a toner image in both sides of imprint material by JP,49-37538,B, JP,54-28740,B, JP,1-44457,A, JP,4-214576,A, etc. is proposed, and becomes JP,1-44457,A and JP,4-214576,A from an image support, an electrification means, an image exposure means, a development means, a cleaning means, etc. especially. It arranges in parallel on two or more set middle imprint object in order of a Magenta (M), cyanogen (C), and black (K), and the method of forming the double-sided copy of a color picture is proposed.

Drawing selection [Repr sentativ drawing]



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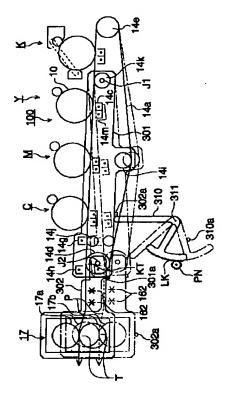
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EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, it becomes recyclable [the black toner which is not conspicuous even if it is prevented that the black toner on a middle imprint object adheres to the image support of other colors, operating frequency is high and it carries out color mixture most]. It becomes recyclable [the black toner which is not conspicuous even if it is prevented that the black toner on a middle imprint object adheres to the image support of other colors especially at the time of a jam, operating frequency is high and it carries out color mixture most].

Drawing selection [Repr sentative drawing]



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TECHNICAL PROBLEM

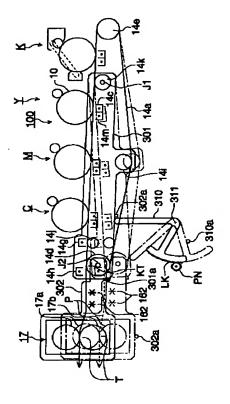
[Problem(s) to be Solved by the Invention] However, the double-sided color picture formation by the above-mentioned proposal Arrange many image formation meanses around a belt-like middle imprint object in order of yellow (Y), a Magenta (M), cyanogen (C), and black (K), and on a belt-like middle imprint object, one color, although image formation is performed in piles, a color toner image at a time The toner on a middle imprint object carries out a re-imprint (adhesion) to an image support at the following image formation process, and the toner of other colors carries out color mixture, and cannot adopt recycling of only a black toner as the black toner which operating frequency tends to recycle highly, either. Moreover, especially, at the time of a jam, the toner of other colors on a middle imprint object adheres to an image support, and the problem of causing color mixture arises.

[0005] This arranges an image formation means in parallel on two or more set middle imprint object in order of yellow (Y), a Magenta (M), cyanogen (C), and black (K). Color picture formation equipment and yellow (Y) which convey imprint material on a middle imprint object, pile up a toner image one by one and form a color toner image on imprint material, After arranging an image formation means in parallel on two or more set middle imprint object in order of a Magenta (M), cyanogen (C), and black (K) and piling up a toner image one by one on a middle imprint object, a problem with the same said of the color picture formation equipment which imprints on imprint material collectively and forms a color toner image arises.

[0006] It aims at offering the color picture formation equipment which this invention solves the above—mentioned trouble, enables recycling of a black toner with the highest operating

above—mentioned trouble, enables recycling of a black toner with the highest operating frequency, and enables recycling of a black toner with the highest operating frequency especially at the time of a jam.

Drawing selection [Representative drawing]



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MEANS

[Means for Solving the Problem] In the color picture formation equipment which lays the toner image which the above-mentioned purpose has yellow, a Magenta, cyanogen, and each black image formation unit, and was formed of each aforementioned image formation unit one by one on top of belt-like a middle imprint object or imprint material While arranging a black image formation unit in the hand-of-cut best style position of the aforementioned middle imprint object and recycling a toner It is attained by the color picture formation equipment characterized by arranging yellow, a Magenta, and the image formation unit of cyanogen in a down-stream position, and collecting toners (1st invention).

[0008] Moreover, the above-mentioned purpose has yellow, a Magenta, cyanogen, and each black image formation unit. In the color picture formation equipment established with a fixing means in the account toner image of back to front which laid the toner image formed of each aforementioned image formation unit one by one on top of belt-like a middle imprint object or imprint material It follows on movement of the aforementioned middle imprint object contact or whose alienation was enabled at yellow, the Magenta, and the image formation unit of cyanogen at the time of the image formation by the black toner. It is attained by the color picture formation equipment characterized by changing the position of the imprint material guidance means to the aforementioned fixing means, or the aforementioned fixing means (2nd invention). [0009]

[Embodiments of the Invention] Hereafter, the gestalt of operation of this invention is explained. In addition, the publication of this column limits neither the technical range of a claim, nor a terminological meaning. Moreover, the decision-explanation in the gestalt of the following operations of this invention does not show the best mode, and does not limit a terminological meaning or the terminological technical range of this invention. In addition, in explanation of the following operation gestalten, the field of the imprint material of the side which counters a front face and the field of another side of imprint material, i.e., a middle imprint object, in the field of the imprint material of the side which counters an image support in an imprint region is called rear face, and the picture imprinted by the rear face of a surface picture and imprint material in the picture imprinted by the front face of imprint material is called rear-face picture. [0010] The image formation process of 1 operation gestalt of the color picture formation equipment in connection with this invention and each mechanism are explained using drawing 1 or drawing 4. Drawing 1 is the cross-section block diagram showing 1 operation gestalt of the color picture formation equipment in connection with this invention, drawing 2 It is drawing showing the toner image formation state in the color picture formation equipment in connection with this invention. drawing 2 (A) It is drawing showing the toner image formation state when imprinting the rear-face picture formed in the image support on a middle imprint object. drawing 2 (B) It is drawing showing the toner image formation state when forming a surface picture in an image support synchronizing with the rear-face picture on a middle imprint object. drawing 2 (C) It is drawing showing the double-sided image formation to an imprint material top, and drawing 3 is drawing showing movement of alienation and the fixing means of a middle imprint object, and an imprint material guidance means, and <u>drawing 4</u> is drawing showing other examples of movement of an imprint material guidance means.

[0011] The photo conductor drum whose 10 is an image support for every color in <u>drawing 1</u>, the scorotron electrification machine whose 11 is an electrification means for every color, The exposure optical system whose 12 is a picture write-in means for every color, the development counter whose 13 is a development means for every color, The middle imprint belt whose 14a is a middle imprint object, the imprint machine whose 14c is an imprint means for every color, The rear-face imprint machine whose 14g is a rear-face picture imprint means, the electric discharge machine whose 14m is an electric discharge means, The paper electrification machine whose 150 is an imprint material electrification means, the paper separation AC electric discharge machine whose 14h is an imprint material separation means, the conveyance section which has the spur 162 whose 160 is an imprint material guidance means, and 17 are fixing equipment which is fixing meanses.

[0012] In this operation form The cleaning equipment 19 which is the photo conductor drum 10 which is an image support for every color, the scorotron electrification machine 11 which is an electrification means for every color, the exposure optical system 12 which is a picture write-in means for every color, the development counter 13 which is a development means for every color, and a photo conductor drum cleaning means for every color The image formation unit 100 is constituted using these as 1 set. Black (K), As opposed to the hand of cut of middle imprint belt 14a which rotates to the counterclockwise rotation which forms yellow (Y), a Magenta (M), and 4 sets of image formation units 100 for every color of cyanogen (C), and shows them by the arrow of drawing 1 according to the color and sequence to form Black (K) is arranged in order of yellow (Y), a Magenta (M), and cyanogen (C) following the best style. You may arrange the image formation unit 100 of Y, M, and C in order of C, M, and Y.

[0013] The photo conductor drum 10 which is an image support forms photosensitive layers, such as a conductive layer, an a-Si layer, or an organic photosensitive layer (OPC), in the periphery of the metal base of the shape of a cylinder formed for example, of aluminum material, and rotates to the clockwise rotation shown by the arrow of <u>drawing 1</u> where a conductive layer is grounded.

[0014] By the control grid held at predetermined potential, respectively, the toner by the corona discharge electrode, and the corona discharge of like-pole nature, the scorotron electrification machine 11 which is an electrification means performs an electrification operation (it sets in this operation form and is minus electrification), and gives uniform potential to the photo conductor drum 10. As a corona discharge electrode of the scorotron electrification machine 11, it is also possible to, use a serrate electrode and a needlelike electrode in addition to this.

[0015] The exposure optical system 12 which is a picture write—in means is arranged around the photo conductor drum 10, as the exposure position on the photo conductor drum 10 is located in the hand—of—cut downstream of the photo conductor drum 10 to the scorotron electrification machine 11 for every color mentioned above. The exposure optical system 12 is a unit for exposure which consists of optical convergence nature optical—transmission objects (tradename : selfoc—lens array) as the exposure element and image formation element of the line which arranged two or more Light Emitting Diodes (light emitting diode) as the drum shaft of the photo conductor drum 10, and a light emitting device of the image exposure light arranged by parallel at main scanning direction in the shape of an array. It is also possible to, use a laser beam study system in addition to this as exposure optical system 12. The exposure optical system 12 for every color carries out image exposure of the photosensitive layer of the photo conductor drum 10 according to the image data of each color which was read by the picture reader of another object and was memorized by memory, and forms an electrostatic latent image on the photo conductor drum 10 for every color.

[0016] The development counter 13 which is a development means maintains a predetermined

gap to the peripheral surface of the photo conductor drum 10. The thickness of 0.5-1mm rotated to the hand of cut and the forward direction of the photo conductor drum 10, It had the development sleeve 131 formed by the nonmagnetic stainless steel or the nonmagnetic aluminum material of the shape of a cylinder with an outer diameter of 15-25mm, and one component or two component developer of yellow (Y), a Magenta (M), cyanogen (C), and black (K) is held in the interior according to the development color for every color. Un-illustrating dashes a development counter 13, it opens the photo conductor drum 10 and a predetermined gap, for example, 100-500 micrometers, by KORO, is maintained at non-contact, by impressing the development bias which superimposed direct current voltage and alternating voltage to the development sleeve 131, performs non-contact reversal development and forms a toner image on the photo conductor drum 10. Toner feed hopper 13a is prepared in the development counter 13 for every color, and the developer of the color which followed the development color of a development counter 13 from toner feed hopper 13a is supplied. It dissociates with a development counter 13, toner feed hopper 13a for every color is prepared in the equipment upper part (upper right of the color picture formation equipment of drawing 1), without preparing toner feed hopper 13a as a development counter 13 and one, and it may be made to supply a developer.

[0017] A volume resistivity is the endless belt of 109 - 1012 ohm-cm preferably 108 to 1016 ohm-cm, for example, middle imprint belt 14a which is a middle imprint object is the seamless belt of the two-layer composition which performed fluorine coating with a thickness of 5-50 micrometers on the outside of a half-conductivity film base with a thickness of 0.1-1.0mm which distributed the electrical conducting material to engineering plastics, such as a denaturation polyimide, a heat-curing polyimide, an ethylene tetrafluoroethylene copolymer, a polyvinylidene fluoride, and a nylon alloy, as a toner filming If it considers as the base of middle imprint belt 14a, a half-conductivity rubber belt with a thickness of 0.5-2.0mm which distributed the electrical conducting material can also be used for silicone rubber or polyurethane rubber. middle imprint belt 14a -- respectively -- a roller -- drive roller 14d and ground roller 14j which are a member, and a belt -- alienation -- it is laid [firmly] across axis-of-rotation roller 14k, follower roller 14e, and tension roller 14i, and rotates to the counterclockwise rotation shown by the arrow of <u>drawing 1</u> follower roller 14e, ground roller 14j, and a belt -- alienation -- fixing and rotating axis-of-rotation roller 14k and drive roller 14d, tension roller 14i is supported by elasticity, such as a non-illustrated spring, possible [movement], and rotates It rotates, and drive roller 14d drives middle imprint belt 14a, and makes it rotate in response to a drive [drive motor / non-illustrated]. rotation of middle imprint belt 14a -- ground roller 14j and a belt -alienation -- axis-of-rotation roller 14k, follower roller 14e, and tension roller 14i follow and rotate The belt slack of middle imprint belt 14a under rotation becomes it tense by tension roller 14i. a belt -- alienation -- axis-of-rotation roller 14k is prepared between the position of the image formation unit 100 of K arranged in the hand-of-cut best style position of middle imprint belt 14a, and image formation unit 100 position of the following Y The recording paper P which is imprint material is supplied to the position where middle imprint belt 14a is laid [firmly] across follower roller 14e, and it is conveyed by middle imprint belt 14a. In the curvature section KT of the edge by the side of the fixing equipment 17 of middle imprint belt 14a laid by drive roller 14d, the recording paper P is separated from middle imprint belt 14a. [0018] The image formation unit 100 for every color is arranged in the outside (on drawing 1) of middle imprint belt 14a which is the above-mentioned middle imprint object, and middle imprint belt 14a is minded. Counter with drive roller 14d and 14h of paper separation AC electric discharge machines which are an imprint material separation means Counter with ground roller 14j and 14g of rear-face imprint machines which are a rear-face picture imprint means Moreover, counter with follower roller 14e and the middle imprint belt cleaning equipment 140 which is a middle imprint object cleaning means is formed. Moreover, on both sides of middle imprint belt 14a, it counters with the photo conductor drum 10 of the image formation unit 100

for every color, it arranges to imprint machine 14c and this imprint machine 14c which are an imprint means for every color, and 14m of electric discharge machines which are the electric discharge means of a middle imprint object is formed.

[0019] Imprint machine 14c which is an imprint means for every color is a corona discharge machine which counters the photo conductor drum 10 for every color, and is formed on both sides of middle imprint belt 14a, and forms imprint region 14b for every color between middle imprint belt 14a and the photo conductor drum 10 for every color. Polar (it sets in this operation gestalt and is plus polarity) direct current voltage opposite to a toner is impressed to imprint machine 14c for every color, and the toner image on the photo conductor drum 10 for every color is imprinted by forming imprint electric field in imprint region 14b on a middle imprint belt 14a top or the front face of imprint material.

[0020] It is preferably constituted by the corona-discharge machine, it is prepared in ground roller 14j prepared between imprint machine 14c and drive roller 14d on both sides of middle imprint belt 14a face to face, polar (it sets in this operation gestalt and is plus polarity) direct current voltage opposite to a toner is impressed, and 14g of rear-face imprint machines which are a rear-face picture imprint means imprints the toner image on middle imprint belt 14a at the rear face of the recording paper P.

[0021] 14m of electric discharge machines which are an electric discharge means for every color is constituted by the corona discharge machine. To the move direction of middle imprint belt 14a if needed to the downstream of imprint machine 14c which is an imprint means for every color It stands in a row with imprint machine 14c for every color, and it is prepared, the alternating voltage which superimposed the direct current voltage of a toner, like-pole nature, or reversed polarity is impressed, and the charge of middle imprint belt 14a in which an electric charge is carried out by voltage impression of imprint machine 14c is discharged.

[0022] It is preferably constituted by the serrate electrode, and it counters with follower roller 14e grounded on both sides of middle imprint belt 14a, and is prepared, and the direct current voltage of a toner and like-pole nature (it sets in this operation gestalt and is minus polarity) is impressed, the paper electrification machine 150 which is an imprint material electrification means is charged, and middle imprint belt 14a is made to adsorb the recording paper P in it. It is also possible to use the paper electrification brush in which the contact and contact release to a corona discharge machine or middle imprint belt 14a other than a serrate electrode are possible, a paper electrification roller, etc. as a paper electrification machine 150.

[0023] 14h of paper separation AC electric discharge machines which are an imprint material separation means is preferably constituted by the corona discharge machine. Counter drive roller 14d grounded by the fixing equipment 17 side-edge section of middle imprint belt 14a on both sides of middle imprint belt 14a if needed, and it is prepared. The alternating voltage which superimposed the direct current voltage of a toner, like-pole nature, or reversed polarity if needed is impressed, the recording paper P conveyed by middle imprint belt 14a is discharged, and it dissociates from middle imprint belt 14a.

[0024] The conveyance section 160 has the spur 162 which is an imprint material guidance means, and is prepared between the curvature section KT of the edge by the side of the fixing equipment 17 of middle imprint belt 14a, and fixing equipment 17. The conveyance section 160 prevents that, and become or a toner fixes on middle imprint belt 14a with the heat from fixing equipment 17 that the toner image supported by middle imprint belt 14a becomes with some weld, and it is hard to imprint. [that middle imprint belt 14a deforms]

[0025] The spur 162 which is an imprint material guidance means has two or more height 162a in a peripheral surface, and is prepared free [rotation] centering on the rotation support shaft 165. A spur 162 guides the rear-face side of the recording paper P, conveys the recording paper P, fixing the penetration direction to the fixing equipment 17 of the recording paper P, is stabilized and conveys the recording paper P to fixing equipment 17 while it prevents disorder of the rear-face toner image of the recording paper P which has a toner image to both sides.

[0026] The fixing equipment 17 which is a fixing means is established in the toner image on the recording paper P which has the nip section T conveyed by consisting of fixing members of the two shape of a roller of fixing roller 17a and sticking-by-pressure roller 17b which have a heater inside, carrying out pinching conveyance of the recording paper P in the nip section T between fixing roller 17a and sticking-by-pressure roller 17b, and adding heat and a pressure.

[0027] Next, an image formation process is explained.

[0028] By starting of the photo conductor drive motor which is not illustrated by the start of image recording, the photo conductor drum 10 of the image formation unit 100 of the black (K) arranged in the hand-of-cut best style position of middle imprint belt 14a rotates to the clockwise rotation shown by the arrow of <u>drawing 1</u>, and grant of potential is simultaneously started by the photo conductor drum 10 of K by electrification operation of the scorotron electrification machine 11 of K.

[0029] After potential is given to the photo conductor drum 10 of K, the picture writing by the 1st chrominance signal, i.e., the electrical signal corresponding to the image data of K, is started by the exposure optical system 12 of K, and it has an electrostatic latent image corresponding to the picture of K of a manuscript picture formed in the front face of the photo conductor drum 10 of K.

[0030] Reversal development of the aforementioned latent image is carried out in the non-contact state by the development counter 13 of K, and a black (K) toner image is formed according to rotation of the photo conductor drum 10 of K.

[0031] The toner image of K used as the rear—face picture formed of the above—mentioned image formation process on the photo conductor drum 10 of K which is an image support is imprinted by imprint machine 14c of K which is an imprint means in imprint region 14b of K on middle imprint belt 14a which is a middle imprint object. Moreover, the charge of middle imprint belt 14a in which the electric charge was carried out by imprint machine 14c of K is discharged with 14vessels of electric discharge machines of K.

[0032] Subsequently, the toner image of K and a synchronization are taken and, as for middle imprint belt 14a, potential is given by the image formation unit 100 of yellow (Y) by the electrization of the scorotron electrification machine 11 of Y. The picture writing by the 2nd chrominance signal, i.e., the electrical signal corresponding to the image data of Y, is performed by the exposure optical system 12 of Y. Of imprint machine 14c of Y whose toner image of Y used as the rear–face picture formed on the photo conductor drum 10 of Y of the non–contact reversal development by the development counter 13 of Y is an imprint means in imprint region 14b of Y, the toner image of the upper shell Y of the toner image of the aforementioned K piles up, and is formed. Moreover, the charge of middle imprint belt 14a in which the electric charge was carried out by imprint machine 14c of Y is discharged with 14vessels of electric discharge machines of Y.

[0033] According to the same process, the superposition toner image of K and Y and a synchronization are taken. The toner image of M used as the rear–face picture corresponding to the image data of M by the 3rd chrominance signal formed on the photo conductor drum 10 of M of the image formation unit 100 of a Magenta (M) sets to imprint region 14b of M. Of imprint machine 14c of M which is an imprint means, the toner image of the upper shell M of the aforementioned K and the toner image of Y piles up, and is formed. Furthermore the superposition toner image of K, Y, and M and the synchronization were taken, and were formed on the photo conductor drum 10 of C of the image formation unit 100 of cyanogen (C). The toner image of C used as the rear–face picture used as the rear–face picture corresponding to the image data of C by the 4th chrominance signal sets to imprint region 14b of C. Of imprint machine 14c of C which is an imprint means, the toner image of the upper shell C of the aforementioned toner image of K, Y, and M piles up, and is formed, and the superposition color toner image of K, Y, M, and C of a rear–face picture is formed on middle imprint belt 14a. Moreover, the charge of middle imprint belt 14a in which the electric charge was carried out by

imprint machine 14c of M and C is discharged with 14vessels of electric discharge machines of M and C. (Drawing 2 (A)).

[0034] Although the toner which remained on the peripheral surface of the photo conductor drum 10 for every color after an imprint is cleaned by cleaning-blade 19a which consists of the rubber material which resulted in the cleaning equipment 19 as a photo conductor drum cleaning means, and contacted the photo conductor drum 10 The toner which collected in the cleaning equipment 19 of the image formation unit 100 of the black (K) arranged in the hand-of-cut best style position of middle imprint belt 14a is discharged by screw 19c from cleaning equipment 19. For example, through conveyance pipe 19d which connotes the rotating spiral spring and conveys a toner, it is conveyed again to the development counter 13 of K, and is recycled (reuse). It is arranged at the downstream of the black (K) image formation unit 100, the toner image supported on middle imprint belt 14a may carry out a re-imprint (adhesion) to the photo conductor drum 10 at the following image formation process, and reuse can be impossible easily. The toner in the cleaning equipment 19 formed in yellow (Y), a Magenta (M), and each image formation unit 100 of cyanogen (C) is discharged by screw 19c from cleaning equipment 19. For example, it is conveyed to the container 190 for toner recycling through conveyance pipe 19d which connotes the rotating spiral spring and conveys a toner, and is collected in the container 190 for toner recycling. It becomes recyclable [a black toner], without the toner of other colors carrying out color mixture to the black toner which operating frequency tends to recycle highly by this.

[0035] After the superposition color toner image which turns into a rear—face picture on middle imprint belt 14a as mentioned above is formed, the synchronization with the color toner image of the rear—face picture currently succeedingly supported by middle imprint belt 14a is taken, and the toner image of K which turns into a surface picture of K by the image formation unit 100 of K is formed on the photo conductor drum 10 of K like the above—mentioned color picture formation process. Under the present circumstances, image data is changed so that the surface picture of K formed on the photo conductor drum 10 of K may turn into a mirror image to the rear—face picture formed on the photo conductor drum 10 of Above K.

[0036] In connection with the surface image formation of K to the photo conductor drum 10 top of K, from the feed cassette 15 whose recording paper P which is imprint material is an imprint material receipt means It is sent out by send roller 15a and conveyed to timing roller 15b as an imprint material feed means. by the drive of timing roller 15b The synchronization with the toner image of the surface picture of K supported on the photo conductor drum 10 of K and the color toner image of the rear–face picture currently supported by middle imprint belt 14a is taken, and imprint region 14b of K is fed. Under the present circumstances, paper electrification is carried out at a toner and like–pole nature, middle imprint belt 14a is adsorbed by the paper electrification machine 150 serrate in the nose of cam where it considered as the contact state and the direct current voltage of a toner and like–pole nature (it sets in this operation gestalt and is minus polarity) was impressed to the recording paper P, and imprint region 14b of K is fed with the recording paper P with it (drawing 2 (B)). By performing paper electrification to a toner and like–pole nature, it prevented paying well with the toner image on middle imprint belt 14a, or the toner image on the photo conductor drum 10 of K, and disorder of a toner image is prevented.

[0037] In imprint region 14b of K, the surface picture on the photo conductor drum 10 of K is imprinted by imprint machine 14c of K as an imprint means by which polar (it sets in this operation gestalt and is plus polarity) voltage opposite to a toner was impressed, on the front face of the recording paper P. At this time, the rear-face picture on middle imprint belt 14a exists on middle imprint belt 14a without the recording paper's P imprinting. Moreover, the charge of middle imprint belt 14a in which the electric charge was carried out by imprint machine 14c of K is discharged with 14vessels of electric discharge machines of K.

[0038] Similarly the synchronization with the color toner image of a rear-face picture and the

toner image of the surface picture of K which are supported by middle imprint belt 14a is taken. The toner image of the surface picture of Y, M, and C is formed on the photo conductor drum 10 of the image formation unit 100 of Y, M, and C. The toner image of the surface picture of Y, M, and C by each imprint machine 14c as an imprint means by which polar (it sets in this operation gestalt and is plus polarity) voltage opposite to a toner was impressed by imprint region 14b of Y, M, and C Y on each photo conductor drum 10, The color toner image of the surface picture of M and C is imprinted one by one by the front face of the recording paper P in order of Y, M, and C. Moreover, the charge of middle imprint belt 14a in which the electric charge was carried out by imprint machine 14c of Y, M, and C is discharged with 14vessels of electric discharge machines of Y, M, and C. At this time, the rear-face picture on middle imprint belt 14a exists on middle imprint belt 14a without the recording paper's P imprinting. Under the present circumstances, with having mentioned above, similarly, image data is changed so that the surface picture of Y, M, and C which are formed on the photo conductor drum 10 of Y, M, and C may become with a mirror image to the rear-face picture formed on the photo conductor drum 10 of Above Y, M, and C, respectively.

[0039] The recording paper P with which the color toner image was imprinted by the front face is conveyed at 14g of rear-face imprint machines as a rear-face picture imprint means by which polar (it sets in this operation gestalt and is plus polarity) voltage opposite to a toner was impressed, and the color toner image of the rear-face picture on the peripheral surface of middle imprint belt 14a bundles it up with 14vessels of rear-face imprint machines, and it is imprinted by the rear face of the recording paper P (drawing 2 (C)).

[0040] The recording paper P with which the color toner image was formed in both sides By the curvature of the curvature section KT of middle imprint belt 14a, and the electric discharge operation with 14h of paper separation AC electric discharge machines as an imprint material separation means prepared in the edge of middle imprint belt 14a if needed Dissociate from middle imprint belt 14a, and it is conveyed through the spur 162 prepared in the conveyance section 160 to the fixing equipment 17 as a fixing means. It is fixed to the toner image on the recording paper P by conveying between the nip sections T between fixing roller 17a and sticking-by-pressure roller 17b, and being able to add heat and a pressure in the nip section T. The recording paper P with which double-sided image recording was made has the front reverse side reversed, is sent, and is discharged with the delivery roller 18 to the tray of the equipment exterior.

[0041] The toner which remained on the peripheral surface of middle imprint belt 14a after an imprint is countered and formed in follower roller 14e on both sides of middle imprint belt 14a, and is cleaned by the middle imprint object cleaning equipment 140 which is a middle imprint object cleaning means have the middle imprint object cleaning blade 141 in which contact and contact release are possible in middle imprint belt 14a by using a pivot 142 as the rotation supporting point.

[0042] Moreover, cleaning equipment 19 removes a remains toner, the history of the photo conductor drum 10 in previous image formation is canceled by the uniform photographic filter before non-illustrated electrification, and the toner which remained on the peripheral surface of the photo conductor drum 10 for every color after an imprint is in the following image formation cycle. As mentioned above, the toner which collected in the cleaning equipment 19 of the image formation unit 100 of the black (K) arranged in the hand-of-cut best style position of middle imprint belt 14a is conveyed again to the development counter 13 of K, and is recycled (reuse). It is arranged at the downstream of the black (K) image formation unit 100, the toner image supported on middle imprint belt 14a may carry out a re-imprint (adhesion) to the photo conductor drum 10 at the following image formation process, and reuse can be impossible easily. The toner in the cleaning equipment 19 formed in yellow (Y), a Magenta (M), and each image formation unit 100 of cyanogen (C) is conveyed to the container 190 for toner recycling, and are collected in the container 190 for toner recycling.

[0043] It becomes recyclable [the black toner which is not conspicuous even if it is prevented by the above that the black toner on a middle imprint object adheres to the image support of other colors, operating frequency is high and it carries out color mixture most by it]. It becomes recyclable [the black toner which is not conspicuous even if it is prevented that the black toner on a middle imprint object adheres to the image support of other colors especially at the time of a jam, operating frequency is high and it carries out color mixture most]. [0044] Of course, also do single-sided image formation which forms a picture at one side of only the front face of imprint material, or a rear face out of the double-sided image formation which forms a picture in both sides of imprint material which was explained with the above-mentioned operation form with above color picture formation equipment.

[0045] It can rotate focusing on the medial axis J1 of axis-of-rotation roller 14k. moreover, the belt with which middle imprint belt 14a is inscribed in the support plate 301 of both sides according to drawing 3 — alienation — It is arranged in the hand-of-cut best style position of middle imprint belt 14a. The downstream of the black (K) image formation unit 100 in which toner recycling is possible, The photo conductor drum 10 of the image formation unit 100 of Y, M, and C, and Y which counters, Drive roller 14d which lays 14m of electric discharge machines and 14g of rear-face imprint machines of imprint machine 14c of M and C, and Y, M and C, 14h of paper separation AC electric discharge machines, and middle imprint belt 14a, the belt of ground roller 14j, tension roller 14i, and the support-plate 301 center of rotation — alienation — axis-of-rotation roller 14k etc. is attached in a support plate 301 Moreover, the support plate 302 of both sides can be rotated focusing on the drive roller 14d medial axis J2, and the spur 162 and the fixing equipment 17 which are an imprint material guidance means are attached in a support plate 302.

[0046] the time of the monochrome image formation by the black (K) toner — a belt — alienation — a support plate 301 is rotated focusing on the medial axis J1 of axis—of—rotation roller 14k, the support plate 301 which has middle imprint belt 14a is moved, and middle imprint belt 14a is made to estrange from yellow (Y), a Magenta (M), and the image formation unit 100 of cyanogen (C)

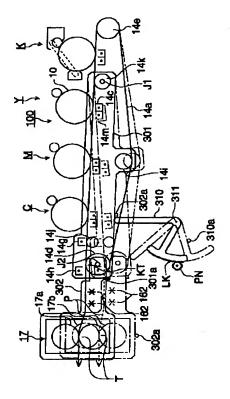
[0047] The rack LK in which the lever 310 which holds a support plate 301 in the state where it was dashed against stopper 302a which engaged with the bottom edge of a support plate 301 in the end, and was prepared in it at the support plate 301 was formed by the other end By rotation of Pinion PN which connects on this rack LK, for example, rotates through non-illustrated a control section and a drive motor at the time of selection of monochrome image formation from a non-illustrated control unit A lever 310 rotates centering on the fixed shaft 311 in an alternate long and short dash line **** position from the position shown in drawing 3 as a solid line. It rotates, the alternate long and short dash line **** position from a position which a support plate 301 shows to drawing 3 as a solid line in connection with this -a belt -- alienation -- until it contacts stopper 310a by using the medial axis J1 of axis-of-rotation roller 14k as the supporting point In the state [that middle imprint belt 14a is in contact with the image formation unit 100 of K], it is estranged from the image formation unit 100 of Y, M, and C. Under the present circumstances, in order to guarantee penetration of the recording paper P to fixing equipment 17, while the support plate 302 currently stopped and held by stopper 301a prepared in the support plate 301 rotates the drive roller 14d medial axis J2 as a center with movement which is drive roller 14d, it is moved below to the position stopped in stopper 302a. A spur 162 and fixing equipment 17 are moved below with movement of a support plate 302 (repositioning). The recording paper P is guided by the spur 162 moved below as a dotted line showed to drawing 3, and it is fixed to the toner image on the recording paper P by being conveyed to the fixing equipment 17 moved below, conveying between the nip sections T between fixing roller 17a and sticking-by-pressure roller 17b, and being able to add heat and a pressure in the nip section T.

[0048] Moreover, as shown in $\underline{\mathsf{drawing}}\ 4$, the spur 162 which is an imprint material guidance

means is attached. The support plate 303 which can rotate is formed focusing on the drive roller 14d medial axis J2. In order to guarantee penetration of the recording paper P to fixing equipment 17 with movement (movement in the alternate long and short dash line **** position shown in drawing 4 as a solid line from a position) in the lower part of the support plate 301 which has middle imprint belt 14a. The support plate 303 of the both sides currently stopped and held by stopper 301a prepared in the support plate 301 with movement of drive roller 14d It is possible to also make it incline and move to the position stopped in stopper 303a, making an alternate long and short dash line **** position rotate the drive roller 14d medial axis J2 as a center from the position shown in drawing 4 as a solid line. With movement of a support plate 303, a spur 162 inclines and it is moved caudad (repositioning). It is fixed to the toner image on the recording paper P by the recording paper's P being guided by the spur 162 arranged by inclining as a dotted line shows to drawing 4, conveying it to fixing equipment 17, conveying between the nip sections T between fixing roller 17a and sticking-by-pressure roller 17b, and being able to add heat and a pressure in the nip section T.

[0049] It becomes recyclable [the black toner which is not conspicuous even if it is prevented by the above that the black toner on a middle imprint object adheres to the image support of other colors, operating frequency is high and it carries out color mixture most by it]. It becomes recyclable [the black toner which is not conspicuous even if it is prevented that the black toner on a middle imprint object adheres to the image support of other colors especially at the time of a jam, operating frequency is high and it carries out color mixture most]. [0050] The composition explained by above-mentioned drawing 2 or drawing 4 Yellow (Y), a Magenta (M), An image formation means is arranged in parallel on two or more set middle imprint object in order of cyanogen (C) and black (K). Color picture formation equipment and yellow (Y) which convey imprint material on a middle imprint object, pile up a toner image one by one and form a color toner image on imprint material, An image formation means is arranged in parallel on two or more set middle imprint object in order of a Magenta (M), cyanogen (C), and black (K). It is possible to suppose that it is the same also about the color picture formation equipment which imprints on imprint material collectively and forms a color toner image, after piling up a toner image one by one on a middle imprint object, it becomes recyclable [the black toner which is not conspicuous even if it is prevented that the black toner on the same effect, i.e., the Nakama imprint object, adheres to the image support of other colors, operating frequency is high and it carries out color mixture to this having mentioned above most] It becomes recyclable [the black toner which is not conspicuous even if it is prevented that the black toner on a middle imprint object adheres to the image support of other colors especially at the time of a jam, operating frequency is high and it carries out color mixture most].

Drawing selection [Representative drawing]



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JAPANESE [JP,2000-206755,A]	
CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS	
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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the cross-section block diagram showing 1 operation gestalt of the color picture formation equipment in connection with this invention.

[Drawing 2] It is drawing showing the toner image formation state in the color picture formation equipment in connection with this invention.

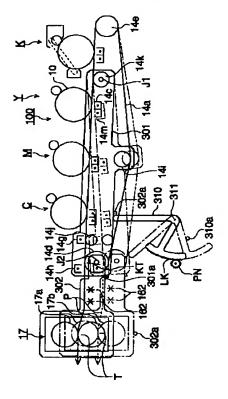
[Drawing 3] It is drawing showing movement of alienation and the fixing means of a middle imprint object, and an imprint material guidance means.

[Drawing 4] It is drawing showing other examples of movement of an imprint material guidance means.

[Description of Notations]

- 10 Photo Conductor Drum
- 11 Scorotron Electrification Machine
- 12 Exposure Optical System
- 13 Development Counter
- 14a Middle imprint belt
- 14c Imprint machine
- 14d Drive roller
- 14g Rear-face imprint machine
- 14h Paper separation AC electric discharge machine
- 14k a belt -- alienation -- an axis-of-rotation roller
- 17 Fixing Equipment
- 19 Cleaning Equipment
- 100 Image Formation Unit
- 162 Spur
- 190 Container for Toner Recycling
- 301,302,303 Support plate
- P Recording paper

Drawing selection [Representativ drawing]



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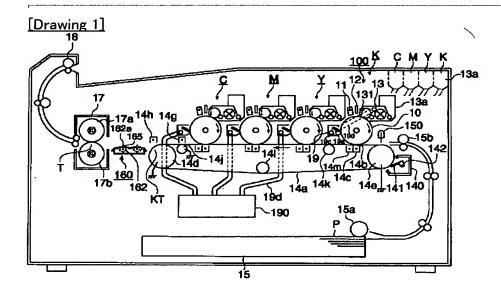
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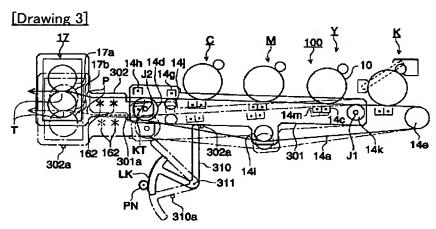
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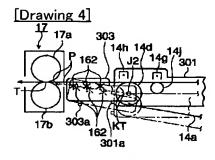
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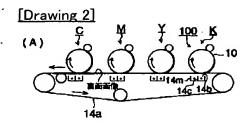
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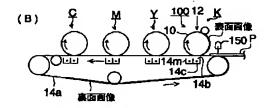
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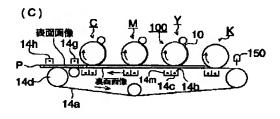




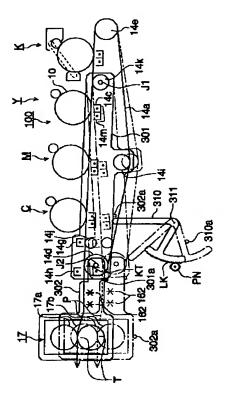








Drawing selection [Representative drawing]



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(19) 日本国格許庁 (JP)

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特開2000-206755 (11)特許出顧公開番号

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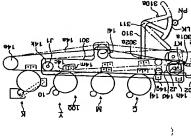
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カラー画像形成装置 (54) (発明の名称)

(57) [財花]

【輠題】 最も使用頻度の高い黒色トナーのリサイクル を可能とし、特にジャム時においても、最も使用頻度の 高い異色トナーのリサイクルを可能とするカラー画像形 成装置を提供すること。 【解決手段】 黒色の画像形成ユニットを中間転写体の 回転方向最上流位置に配設してトナーのリサイクルを行 うと共に、イエロー、マゼンタ及びシアンの画像形成コ ニットを下流位置に配数してトナーの回収を行うことを 特徴とするカラー画像形成装置。



特別2000-206755

ピーを形成する方法が協案されている。

|発明が解決しようとする瞑題|| しかしながら、上記提 策による両面カラー画像形成は、ペルト状の中間転写体 の周囲にイエロー (Y)、マゼンタ (M)、シアン

最も使用頻度が高くリサイクルし易い異色トナーにも他 の色のトナーが混色し、黒色トナーのみのリサイクルも 採用できない。また特に、ジャム時には、中間転写体上 **を<u>倒むて画像形成を行ってゆくが、中間</u>転写体上のトナ** の他の色のトナーが像担持体に付着し、限色を起こすと し、ヘルト状の中間既写体上に1色ずしカラートナー俊 一が次の画像形成工程で像担持体へ再転写(付着)し、 (C)及び黒色(K)の順に像形成手段を数多く配置 いう問題が生じる。 으

(M)、シアン(C)及び黒色(K)の順に像形成手段 転写材を搬送し、転写材上に順次トナー像を重ね合わせ たカラートナー像を形成するカラー画像形成装置やイエ を複数組中間転写体上に並列に配置し、中間転写体上に ロー (Y)、マゼンタ (M)、シアン (C) 及び開色 [0005] このことは、イエロー (Y)、マゼンタ ន

(K) の傾に做形成手段を複数組中間転写体上に並列に 後、一括して甑写材上に転写してカラートナー像を形成 するカラー画像形成装置についても同様の問題が生じ 配置し、中間転写体上に順次トナー像を重ね合わせた

0006]本発明は上記の問題点を解決し、役も使用 頻度の高い黒色トナーのリサイクルを可能とし、特にジ ナム時においても、最も使用頻度の高い黒色トナーのリ サイクルを可能とするカラー画像形成装置を掻供するこ

とを目的とする。 [0000]

ナーのリサイクルを行うと共に、イエロー、マゼンタ及 **ぴシアンの画像形成ユニットを下流位置に配設してトナ** し、前記各画像形成ユニットにより形成されたトナー像 をベルト状の中間転写体或いは転写材に順次重ね合わせ トを前記中間転写体の回転方向最上流位置に配設してト **一の回収を行うことを特徴とするカラー画像形成装置に** るカラー画像形成装置において、馬色の画像形成ユニッ [韓題を解決するための手段] 上記目的は、イエロー マゼンタ、シアン及び黒色の各画像形成ユニットを有 よって達成される (第1の発明) \$

シアン及び馬色の各画像形成ユニットを有し、前配各画 タ及びシアンの画像形成ユニットに当接或いは離間可能 象形成ユニットにより形成されたトナー像をベルト状の - 像を定着手段にて定着するカラー画像形成装置におい て、県色のトナーによる画像形成時、イエロー、マゼン とした前配中間転写体の移動に伴い、前配定着手段への 中間転写体或いは転写材に順次重ね合わせた後前配トナ 転写材案内手段或いは前配定着手段の位置を変更するこ [0008] また、上配目的は、イエロー、マゼンタ、

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| 特許諸水の範囲|

各画像形成ユニットを有し、前配各画像形成ユニットに 【請求項1】 イエロー、マゼンタ、シアン及び黒色の てり形成された トナー像をベルト状の中間転写体改いは **毎写材に順次重ね合わせるカラー画像形成装置におい**

流位置に配設してトナーの回収を行うことを特徴とする **集色の画像形成ユニットを前配中間転写体の回転方向**最 イエロー、セゼンタ及びシアンの画像形成ユニットを下 上流位置に配数してトナーのリサイクルを行うと共に、 カラー画像形成装置。

【請求項2】 イエロー、マゼンタ、シアン及び馬色の 各画像形成ユニットを有し、前配各画像形成ユニットに より形成されたトナー像をベルト状の中国航岸体投いは **応写材に順次重ね合わせた後前配トナー像を定着手段に** て定着するカラー画像形成装置において、

材案内手段或いは前記定着手段の位置を変更することを **集色のトナーによる画像形成時、イエロー、マゼンタ及** びシアンの画像形成ユニットに当接或いは離間可能とし た前記中間転写体の移動に伴い、前記定着手段への転写

【諸求項3】 前配中間転写体を介して前配転写材に両 特徴とするカラー画像形成装置。

面画像を形成することを特徴とする請求項1または2に 記載のカラー画像形成装置。 [発明の詳細な説明]

形成されたカラートナー像を、重ね合わせてカラー画像 【発明の属する技術分野】本発明は複数の像担枠体上に を形成する電子写真方式のカラー画像形成装置に関す [0001]

[0002]

[従来の技術] 従来、両面コピーにおいては、像担特体 し、これを一旦両面反転給紙装置に収納し、再び像担券 本上に形成された画像とタイミングを合わせて両面反転 給紙装置より転写材を給送し、転写材上に他方の面の画 上に形成された一方の面の画像を転写材上に転写、定着 象を転写、定着する方法がとられている。

【0003】この両面コピー装置は、上記の如く、両面 の報法が行われるので、転写材報法の信頼性が低く、ジ 数組中間転写体上に並列に配置し、カラー画像の両面コ ナム等を引き起こす原因となっていた。これに対し、特 公昭49-37538号公報、稀公昭54-28740 4576号公報等により転写材の両面にトナー像を形成 マゼンタ (M)、シアン (C) 及び黒色 (K) の頃に技 反転給紙装置への給送や定替装置を2度通す等の転写材 号公報や特開平1-44457号公報や特開平4-21 後、1回で定着を行うものが提案され、特に、特開平1 - 4 4 4 5 7 号公報や特開平 4 - 2 1 4 5 7 6 号公報等 には像担特体、帯電手段、像露光手段、現像手段、クリ ーニング手段等よりなる像形成手段をイエロー (A)、

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とを特徴とするカラー画像形成装置によって達成される

て、既写版において像担辞体に対向する側の転写材の面 **映施の形態における断定的な説明は、ベストモードを示** すものであって、本発明の用語の意義や技術的範囲を限 [発明の実施の形態] 以下、本発明の実施の形態を説明 する。なお、本欄の記載は請求項の技術的範囲や用語の 意義を限定するものではない。また、以下の、本発明の 定するものではない。なお以下の実施形態の説明におい を安面、転写材の他方の面すなわち中間転写体に対向す る側の転写材の面を裏面といい、転写材の接面に転写さ れる画像を按面画像、転写材の裏面に転写される画像を 英面画像という。

奥施形態の画像形成プロセス、各機構にひいて、図1な 像担持体に形成した裏面画像を中間転写体上に転写する 中間転写体上の裏面画像と同期して像担持体に要面 り、図2(C)は、転写材上への両面画像形成を示す図 いし図4を用いて説明する。図1は、本発明にかかわる カラー画像形成装置の一実施形態を示す断面構成図であ り、図2は、本発明にかかわるカラー画像形成装置にお であり、図3は、中間転写体の艦闘と定着手段及び転写 材案内手段の移動とを示す図であり、図4は、転写材案 **【0010】本発明にかかわるカラー画像形成装置の-**けるトナー像形成状態を示す図であり、図2(A)は、 画像を形成するときのトナー像形成状態を示す囚であ ときのトナー像形成状態を示す図であり、図2 (B)

ある感光体ドラム、11は各色毎の帯電手段であるスコ ロトロン帯電器、12は各色毎の画像曹込手段である翼 の転写手段である転写器、14gは裏面画像転写手段で ある英面転写器、14mは除電手段である除電器、15 0は転写材帯電手段である紙帯電器、14hは転写材分 艦手段である紙分離AC除電器、160は転写材案内手 [0011] 図1において、10は各色毎の像担特体で a は中間転写体である中間転写ペルト、1 4 c は各色毎 段である拍車162を有する撤送部、17は定着手段で 光光学系、13は各色毎の現像手段である現像器、14 ある定替装置である。

内手段の移動の他の倒を示す図である。

4 a の回栖方向に対して、破上猟に眠角(K)を、続い [0012] 本実施形態においては、各色毎の像担特体 ロトロン帯電器11、各色毎の画像巷込手段である露光 光学系12、各色毎の現像手段である現像器13及び各 00を4組設けて、形成する色と順序に従って、図1の 矢印にて示す 反時計 方向に回覧される中間 転写 ベルト1 である戯光体ドラム10、各色毎の帯電手段であるスコ 色毎の感光体ドラムクリーニング手段であるクリーニン 00を構成し、 果色 (K)、 イエロー (Y)、 マゼンタ (M) 及びシアン (C) の各色毎の画像形成コニット1 が装置19は、これらを1組として画像形成ユニット1

てイエロー (Y)、マゼンタ (M) 及びシアン (C) の 頃に配置する。Y、M、Cの画像形成ユニット100 は、C、M、Yの順に配列してもよい。

ばアルミ材によって形成される円筒状の金属基体の外周 **等の感光層を形成したものであり、導電層を接地した状** 【0013】像担持体である感光体ドラム10は、例え に、導電層、aーSi層あるいは有機感光層(OPC) 数で図1の矢印で示す時計方向に回転される。

コロトロン帯電器11のコロナ放電電極としては、その は、それぞれ所定の電位に保持された制御グリッドとコ [0015] 画像春込手段である鷗光光学系12は、感 ロナ放電電極によるトナーと同極性のコロナ放電とによ って帯電作用(本実施形態においてはマイナス帯電)を 行い、戯光体ドラム10に対し一様な電位を与える。ス [0014] 帯電手段であるスコロトロン帯電器11 地鋸歯状電極や針状電極を用いることも可能である。 10

コロトロン帯電器11に対して感光体ドラム10の回転 発光粟子としての例えばLED (発光ダイオード)を複 数個アレイ状に並べた線状の露光繋子と、結像繋子とし 方向下流側に位置するようにして感光体ドラム10の周 辺に配置される。露光光学系12は、感光体ドラム10 レイ)とで構成される臨光用ユニットである。 臨光光学 **系12としてはその他レーザ光学茶を用いることも可能** 光体ドラム10上での露光位置が、前述した各色毎のス のドラム軸と平行に主走査方向に配列された像館光光の ての光棋東柱光伝送体(商品名:セルフォックレンズア である。各色毎の露光光学系12は、別体の画像読み取 り装置によって読み取られメモリに記憶された各色の画 像データに従って感光体ドラム10の感光層を像露光 し、各色毎の核光体ドラム10上に静電階像を形成す R ន

に、現像器13と分離して装置上部 (図1のカラー画像 形成装置の右上) に各色毎のトナー供給ホッパ13aを mm、外径15~25mmの円筒状の非磁性のステンレ スあるいはアルミ材で形成された現像スリーブ131を 或いは二成分現像剤を収容している。現像器13は不図 ており、現像スリーブ131に対して直流電圧と交流電 圧を重畳した現像パイアスを印加することにより、非接 3aが散けられており、トナー供給ホッパ13aから現 [0016] 現像手段である現像器13は、啓光体ドラ ム10の周面に対し所定の関隊を保ち、感光体ドラム1 0の回転方向と順方向に回転する例えば厚み0.5~1 有し、内部に各色毎の現像色に従いイエロー (Y)、マ ゼンタ(M)、シアン(C)および馬色(K)の一成分 隙、例えば100~500 nmをあけて非接触に保たれ 触の反転現像を行い、感光体ドラム10上にトナー像を 形成する。各色毎の現像器13にはトナー供給ホッパ1 像器13の現像色に従った色の現像剤が補給される。ト ナー供給ホッパ13aを現像器13と一体として設けず 示の突き当てコロにより感光体ドラム10と所定の間 23

父け現像剤の補給を行うようにしてもよい。

従動ローラ14e、アースローラ14j、ベルト権関回 版軸ローラ14k及び駆動ローラ14dは固定して回転 k は中間転写ペルト14aの回転方向最上流位置に配置 象形成ユニット100位置との間に散けられる。中間転 さ5~50μmのフッ珠コーティングを行った2層構成 ソションローラ14;がΆ動して回転される。回転中の されるKの画像形成コーット100の位置と次のYの画 【0017】中間転写体である中間転写ベルト14aは **体徴抵抗率が108~1016Ω・cm、好ましくは109 イミド、熱硬化ポリイミド、エチレンテトラフルオロエ** チレン共重合体、ポリフッ化ピニリデン、ナイロンアロ イ毎のエンジニアリングプラスチックに導電材料を分散 した厚さ0、1~1、0mmの半導電性フィルム基体の 外側に、好ましくはトナーフィルミング防止層として厚 のシームレスベルトである。中間転写ベルト14aの基 **存としたは、いの街に、ツリコンゴム楔にはウフタンゴ** ム等に導電材料を分散した厚さ0. 5~2. 0mmの半 導電性ゴムベルトを使用することもできる。中間転写べ 4 k と従動ローラ 1 4 e とテンションローラ 1 4 i とに され、テンションローラ141は不図示のパネ苺の硝力 により移動可能に支持されて回転される。不図示の駆動 モータよりの駆動をラけて駆動ローラ14dが、回転さ れ、中間転写ベルト14aを駆動して回転させる。中間 **哲学ペルト14aの回覧によりアースローラ14j、ペ** ルト艦間回転軸ローラ14k、従動ローラ14e及びデ 中国 骸 ゆく テトコ 4 a の ヘケト 皆 み が アンションロー ア 14 iにより緊張される。ペルト離間回転軸ローラ14 **写ベルト14aが従動ローラ14eに張祭される位置に** 哲写材である記録紙Pが供給され、中間転写ペルト14 aによって撤送される。駆動ローラ14dに張梁される 中国転与ベルト14aの応替装置17回の結結の曲路部 KTにおいて中国教師ペルト14gから記録紙Pが分離 ~1015U・cmの無猫ペプトかめり、倒火は好ねポリ ルト14aは、それぞれローラ部材である駆動ローラ1 4 d とアースローラ 1 4 j とペルト艦間回転軸ローラ 1 服架され、図1の矢印で示す反時計方向に回転される。

3の外側(図1の上側)に各色毎の画像形成ユニット1 0 0 が配設され、中間転写ペルト1 4 a を介して、駆動 【0018】上記中閲転写体である中間転写ペルト14 ローラ14dと対向し転写材分離手段である紙分離AC 除電器14hが、アースローラ14;と対向して最面画 **ラ14eと対向し中間航写体クリーニング手段である中** た、中間転写ペルト14gを挟んで各色毎の画像形成コ **ニット100の感光体ドラム10と対向し各色毎の転**写 年段である転写器14c及び該転写器14cに配列して 像転写手段である裏面転写器14gが、また、従動ロー 関転写ベルトクリーニング装置140が設けられ、ま 中間転写体の除電手段である除電器 1 4 mが設けられ

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0に対向して設けられるコロナ放電器であり、中間転写 ペルト14aと各色毎の感光体ドラム10との間に各色 毎の転写域14bを形成する。各色毎の転写器14cに 性)の直流電圧を印加し、転写域14トに転写電界を形 中間費時ペルト148を挟んで各色毎の膨光体ドラム1 [0019] 各色毎の転写手段である転写器14cは、 はトナーと反対極性(本実紘形態においてはプラス極

の間に設けられるアースローラ14」に対向して設けら れ、トナーと反対極性(本実紘形態においてはプラス極 性)の直流電圧が印加され、中間転写ベルト14a上の ルト14aを挟んで転写器14cと駆動ローラ14dと 【0020】 英面画像転写手段である英面転写器148 は好ましくはコロナ放電器により構成され、中間転写~ トナー像を記録紙Pの裏面に転写する。

一像を中間転写ペルト14a上または転写材の按面に転

成することにより、各色毎の感光体ドラム10上のトナ

ト14 aの移動方向に対し、各色毎の転写手段である転 **宜畳した交流電圧が印加され、転写器 1 4 c の電圧印加** 【0021】各色毎の除電手段である除電器14mはコ ロナ放電器により構成され、必要に応じて中間転写ベル 写器14cの下流側に、各色毎の転写器14cと並列し **で設けられ、トナーと同極性または逆極性の直流電圧を** により荷包される中国転写ペルト14mの配荷を除電す 8

[0022] 転写材帯電手段である紙帯電器150は好 間転与ベルト14aに吸着させる。紙帯電路150とし ては鋸齿状電極の他に、コロナ放電器や中間転写ベルト 14 aに当扱および当接解除可能な紙帯電ブラシや紙帯 4aを挟んで笹地された従動ローラ14eと対向して設 ス極性)の直流電圧が印加され、配録紙Pを帯電して中 けられ、トナーと回極性(本実権形態においてはマイナ ましくは鋸歯状鵯極により構成され、中間骶耳ベルト1 電ローラ等を用いることも可能である。

応じて中間低時ペペト14aの庇格状間17回路部に中 4hは好ましくはコロナ放電器により構成され、必要に dに対向して散けられ、必要に応じてトナーと回極性ま 中間転写ベルト14mにより搬送される記録紙Pを除電 間転写ペルト14aを挟んで接地された駆動ローラ14 [0023] 転写材分離手段である紙分離AC除電器] たは逆極性の直流電圧を重畳した交流電圧が印加され、 した中国暦年ペグト14aから分輪する。 6

|0024||概送部160は転写材案内手段である柏車 5。搬送部160は、定着装置17からの熟により、中 くなったり、中間転写ベルト14a上にトナーが固発し 関転写ペルト14aが変形したり、中間転写ペルト14 | 62を有し、中間転写ペルト14aの定着装置11億 a に担持されるトナー像が融着気味になって転写しにく の絡部の曲母部KTと仮類被関17との間に設けられ 23

たりすることを防止する。

に複数の突起部162aを有し、回転支持軸165を中 とともに、記録紙Pの定着装置11への進入方向を一定 【0025】転写材案内手段である柏車162は、周面 心として回転自在に散けられる。 拍車162は、記録紙 Pの英面側をガイドして記録紙Pを搬送し、両面にトナ 一像を有する記録紙Pの英面トナー像の乱れを防止する にしながら配録紙Pを安定して定着装置17~と搬送す 【0026】定着手段である定着装置17は、内部にヒ ータを有する定増ローラ17aと圧着ローラ17bとの 2本のローラ状の定着部材で構成され、定着ローラ17 a と圧増ローラ17bとの間のニップ部Tで記録紙Pを **섲杵鍛送し、熟と圧力とをくわえることにより、ニップ** 的Tを搬送される記録紙P上のトナー像を定着する。 [0027]次に画像形成プロセスを説明する。

ット100の感光体ドラム10が図1の矢印で示す時計 【0028】画像記録のスタートにより不図示の感光体 駆動モータの始動により、中間転呼ベルト14aの回転 方向最上流位置に配置される馬色 (K) の画像形成ユニ 方向へ回転され、同時にKのスコロトロン帯電器11の 帯配作用によりKの感光体ドラム10に配位の付与が開

もと、KのQK光光学来12によって第1の色信号すなわ 【0029】Kの概光体ドラム10は電位を付与された ちKの画像ゲータに対応する電気信号による画像書込が 開始され、Kの戯光体ドラム10の要面に原稿画像のK の画像に対応する静電潜像を形成される。

の状態や反転現像されKの数光体ドラム10の回転に応 【0030】前配の潜像はKの現像器13により非接触 い既句 (K) のトナー做が形成される。

手段であるKの転写器14cによって、中間転写体であ る中間航時ペルト14a上に簡厚される。またKの航時 [0031] 上記の画像形成プロセスによって像担特体 であるKの概光体ドラム10上に形成された裏面画像と なるKのトナー像が、Kの骸D模14bにおいて、骸D 器14cにより荷電された中間転写ベルト14aの電荷 はKの除電器14mにより除電される。

間転写ベルト14gの電荷はYの除電器14mにより除 一像と同期が取られ、イエロー (Y) の画像形成ユニッ 形成される。またYの転写器14cにより荷憶された中 [0032] 次いで中国暦四ペルト14aは、Kのトナ ト100によりYのスコロトロン帯電器11の帯電作用 により電位が付与され、Yの露光光学系12によって第 2の色信号すなわちYの画像データに対応する電気信号 による画像書込が行われ、Yの現像器13による非接触 の反転現像によってYの啓光体ドラム10上に形成され た要面画像となるYのトナー像が、Yの転写域14bに おいて、配写手段であるYの転写器14cによって、前 **記のKのトナー像の上からYのトナー像が倒ね合わせて**

て、転写手段であるMの転写器14cによって、前記の れた、第3の色信号によるMの画像データに対応する要 面画像となるMのトナー像が、Mの転写坂14bにおい 形成され、更にK、Y、Mの重ね合わせトナー像と同期 りこの啓光体ドラム10上に形成された、第4の色信号 によるこの画像データに対応する英面画像となる英面画 【0033】回桜のプロセスにより、K、Yの重ね合わ **セトナー像と同期が取られ、マゼンタ(M)の画像形成** ユニット100によりMの戯光体ドラム10上に形成さ K、Yのトナー像の上からMのトナー像が重ね合わせて が取られ、シアン (C) の画像形成ユニット100によ Y、Mのトナー像の上からCのトナー像が重ね合わせて 像となるCのトナー像が、Cの転写域14bにおいて、 版写手段であるCの版写器14cによって、前記のK、 **形成され、中配幣時ペケト14g上に凝固画像のK、**

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写ペルト14aの観荷はM、Cの除電器14mにより除 る。またM、Cの転写器14cにより荷電された中間転 Y、M及びCの重ね合わせカラートナー像が形成され 電される。(図2(A))。

県色 (K) の画像形成ユニット100の下流側に配置さ 【0034】転写後の各色毎の慰光体ドラム10の周面 0 に当接したゴム材から成るクリーニングプレード19 トナーを搬送する搬送パイプ 19 dを通して再度Kの現 スクリュウ19 cによりクリーニング装置19から排出 され、例えば回転する螺旋状パネを内包してトナーを搬 送する搬送パイプ194を通してトナー回収容器190 これにより、最も使用頻度が高くリサイクルし易い黒色 トナーに他の色のトナーが混色することなく、黒色トナ 上に残ったトナーは、戯光体ドラムクリーニング手段と してのクリーニング装置19にいたり、戯光体ドラム1 aによってクリーニングされるが、中間転写ベルト14 aの回転方向最上流位置に配置される黒色 (K)の画像 形成ユニット1000クリーニング被倒19内に溜まっ たトナーはスクリュウ19cによりクリーニング装置1 9から排出され、例えば回転する螺旋状パネを内包して れ、中間転写ペルト14a上に柏符されるドナー像が次 の画像形成工程で感光体ドラム10に再転写(付着)す レゼンタ (M) 及びシアン (C) の各画像形成ユニット 100に設けられるクリーニング装置 19内のトナーは 像器13~と搬送され、リサイクル(再利用)される。 へと概法され、トナー回収容器190内に回収される。 る可能性があり再利用ができにくい、イエロー (X) 一のみのリサイクルが可能となる。 8

[0035] 以上のようにして中間転写ペルト14a上 **西画像のカラートナー像との同期がとられて、Kの画像** 一像が上記のカケー画像形成プロセスと回扱にしてKの に英面画像となる重ね合わせカラートナー像が形成され た後、引続き中間転写ベルト14mに担持されている異 形成ユニット100によりKの教面画像となるKのトナ

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ドラム10上に形成されるKの装面画像は、前記Kの感 敷光体ドラム10上に形成される。この際、Kの感光体 光体ドラム10上に形成した異面画像に対して観像とな **るように画像データが変更される。**

動によって、Kの数光体ドラム10上に担持されたKの ナー像やKの感光体ドラム10上のトナー像と引き合う 形成にともなって転写材である記録紙Pが転写材収納手 Kの暫写域14bへ給送される。この際、配録紙Pに当 イナス極性)の直流電圧が印加された先端が鋸歯状の紙 聞され、中間転写ベルト14aに吸着されてKの転写域 146~給送される(図2(B))。トナーと同極性に 【0036】Kの終光存ドラム10上へのKの按個画像 ローラ15b〜搬送され、タイミングローラ15bの駆 数面画像のトナー像と、中間転写ベルト14aに担持さ 段状態とされトナーと同極性(本実施形態においてはマ 帯電器150により、記録紙Pがトナーと同極性に紙帯 低帯電を行うことにより、中間転写ペルト14a上のト 段である給紙カセット15より、送り出しローラ15a により送り出され、転写材給送手段としてのタイミング れている英面画像のカラートナー像との同期がとられて ことを防止して、トナー像の乱れを防止している。

(本実施形態においてはプラス極性) の電圧が印加され 体ドラム10上の装面画像が記録紙Pの装面に転写され る。このとき、中間転写ベルト14a上の裏面画像は記 ペルト14aの粗荷はKの除電器14mにより除電され た骸写手段としてのKの骸写器14cによってKの戯光 **段紙Pに転写されないで中間転写ペルト14a上に存在** する。またKの転写器14cにより荷配された中間転写 【0037】Kの簡写被14bではトナーと反対極性

置140によりクリーニングされる。

像が、Y、M、Cの順に配録紙Pの要面に順次転写され 【0038】回接にした、中国精時人グト14aに柏林 されている英面画像のカラートナー像とKの数面画像の 欧光体ドラム10上に形成され、Y、M、Cの安面画像 された転写手段としての各転写器14cによって各啓光 る。またY、M、Cの転写器14cにより荷聞された中 により除聞される。このとき、中間転写ペルト14a上 M、Cの概光体ドラム10上に形成されるY、M、Cの 安面画像は、前記Y、M、Cの戯光体ドラム10上に形 ニット100によりY、M、Cの按面画像のトナー像が のトナー像がY、M、Cの転写域14bでトナーと反対 極性(本実施形態においてはプラス極性)の電圧が印加 関転写ペルト14gの電荷はY、M、Cの除電器14m の要面画像は記録紙Pに転写されないで中間転写ベルト 成した英面画像に対してそれぞれ鏡像となるように画像 トナー像との同期がとられて、A、M、Cの画像形成ユ 体ドラム10上のY、M、Cの按面画像のカラートナー 14a上に存在する。この際前述したと同様に、Y、

[0039] 按面にカラートナー像が転写された記録紙

データが変更される。

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極性)の配圧を印加した英面画像転び手段としての英面 転写器14m~と搬送され、要面転写器14mにより中 Pは、トナーと反対極性(本実紘形態においてはプラス 間転写ペルト14aの周面上の裏面画像のカラートナー 像が一括して記録紙Pの英面に転写される(図2

Pは、中国精体ペケト14gの曲路街KTの曲路と、中 国転与ベルト14aの雑部に必要に応じて設けられる転 写材分離手段としての紙分離AC除電器14hによる除 散送部160に設けられた拍車162を通して定着手段 ニップ部Tで敷と圧力とをくわえられることにより記録 紙P上のトナー像が定着される。両面画像配録がなされ た配録紙Pは数異を反転されて送られ、排紙ローラ18 [0040] 両面にカラートナー像が形成された配録紙 としての定着装置17~と搬送され、定着ローラ17a 電作用とにより、中間転写ペルト14aから分離され、 と圧着ローラ176との間のニップ部T間を搬送され、 により装置外部のトレイへ排出される。

中間航母体クリーニングプレード141を有する中間転 残ったトナーは、中間転写ペルト14aを挟んで従動ロ 一ラ14 eに対向して設けられ、支軸142を回転支点 として中間転写ベルト14mに当接及び当接解除可能な 【0041】 哲写後の中間既好パガト14gの国面上に 写体クリーニング手段である中間転写体クリーニング装 8

[0042] また、転写後の各色毎の感光体ドラム10 より先の画像形成における概光体ドラム10の履歴が解 うに、中間転写ペルト14gの回転方向最上流位置に配 消されて、女の画像形成サイクルにはいる。前述したよ 聞される馬色(K)の画像形成ユニット1000クリー の周面上に残ったトナーは、クリーニング装置19によ り残留トナーを除去され不図示の帯電前の一様観光器に ニング装置 1 9 内に溜まったトナーは再度Kの現像器 1 3~と概法されてリサイクル (再利用) され、 照色 ಜ

像形成工程で感光体ドラム10に再転写(付着)する可 一回収容器190~と撤送され、トナー回収容器190 **読첱があり再利用ができにくい、イエロー(Y)、 レゼ** ンタ (M) 及びシアン (C) の各画像形成ユニット10 0に設けられるクリーニング装置19内のトナーはトナ 中間転写ペルト14g上に担持されるトナー像が次の画 (K) の画像形成ユニット100の下流側に配置され \$

【0043】上記により、中間転写体上の黒色トナーが 他の色の像担特体に付着することが防止され、最も使用 上の黒色のトナーが他の色の像祖特体に付着することが 防止され、最も使用頻度が高く混色しても目立たない黒 頻度が高く脱色しても目立たない開色トナーのリサイク 色トナーのリサイクルが可能となる。 内に回収される。

【0044】上記のカラー画像形成装置では、上述の実

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れ、トナーリサイクケ戸部な眠色(K)の画像形成ユニ ット100の下流圏の、Y、M、Cの画像形成ユニット 100の概光体ドラム10と対向するY、M、Cの転写 ンションローラ141及び支持板301回転中心のベル **心軸 J 2を中心として回転可能であり、転写材案内手段** [0045]また図3によれば、両側の支持板301は 中間航却スケト14aに内扱されるスケト艦間回転軸ロ 器14c及びY、M、Cの除電器14mや要面転写器1 4 gや紙分離AC除電器14hや中間転写ベルト14a を般架する駆動ローラ14d、アースローラ14j、テ ト離間回転軸ローラ14k等が支持板301に取付けら れる。また両側の支持板302は駆動ローラ144の中 である拍車162や定着装置17が支持板302に取付 **一ラ14kの中心軸J1を中心として回転可能であり、** 中間転写ペルト14aの回転方向最上流位置に配置さ H5h5

【0046】 **単色(K)のトナーによるモノクロ画像形** 成時、ベルト艦間回転軸ローラ14kの中心軸 11を中 **ひとして支持板301を回覧して、中間航路ペグト14** a を有する支持板301を移動し、中間転写ベルト14 aをイエロー (Y)、マゼンタ (M) 及びシアン (C) の画像形成ユニット100から離覧させる。

10を、その他端に設けられたラックLKと、餃ラック [0047] 支持板301の下側指部に、その一緒にて 係合し、支持板301に設けられたストッパ302aに 突き当てられた状態で支持板301を保持するレバー3 LKに繋合し、例えば不図示の操作部よりモノクロ画像 形成の選択時に不図示の制御部及び駆動モータを通して 回転されるピーオンPNの回転により、図3に実線で示 す位置から一点鐵線示す位置に固定軸311を中心とし てレパー310が回動され、これに伴い支持板301が 図3に実験で示す位置から一点徴線示す位置にベルト離 間回転軸ローラ14kの中心軸 J1を支点としてストッ パ310aに当接するまで回動され、中間転写ベルト1

状髄で、Y、M及びCの画像形成ユニット100から橇 4 a がKの画像形成ユニット100には当接したままの 聞される。この際、定着装置11~の記録紙Pの進入を 保証するため、支持板301に設けられたストッパ30 1gにより係止、保持されていた支持板302が駆動ロ **ーラ14dの移動とともに、駆動ローラ14dの中心軸** J2を中心として回転されながら、ストッパ302aに て係止される位置まで下方に移動される。支持板302 の移動に伴い、柏車162及び定着装置17が下方に移 動(位置変更)される。記録紙Pは図3に点線で示すよ 5に、下方に移動された拍車162により案内されて、

ラ17aと圧着ローラ17bとの間のニップ部T間を搬 送され、ニップ部Tで熟と圧力とをくわえられることに **より記録紙P上のトナー像が定着される。** [0048]また図4に示すように、転写材案内手段で ある柏車162が取付けられ、駆動ローラ144の中心 **柚J2を中心として回転可能な支持板303を散け、中** 間転写ペルト148を有する支持板301の下方への移 動(図4に実様で示す位置から一点鎖線示す位置への移 動)に伴い、定着装置17~の記録紙Pの進入を保証す るため、支持板301に散けられたストッパ301aに より係止、保持されていた両側の支持板303を、駆動 ローラ14dの移動とともに、図4に実線で示す位置か 5-- 点観線示す位置に、駆動ローラ144の中心軸12 **を中心として回覧さわながで、ストッパ303gにて保** る。支持板303の移動に伴い、柏車162が傾斜して 下方に移動(位置変更)される。 記録紙Pは図4に点線 で示すように、傾斜して配置された拍車162により案 ニップ部Tで熱と圧力とをくわえられることにより記録 内されて定着装置17~と搬送され、定着ローラ17g と圧着ローラ176との間のニップ部工間を搬送され、 止される位置まで傾斜して移動させることも可能であ 紙P上のトナー像が定着される。 2

【0049】上記により、中間転写体上の黒色トナーが 他の色の像担持体に付着することが防止され、最も使用 ルが可能となる。特にジャム時においても、中間転写体 上の黒色のトナーが他の色の像担特体に付着することが 坊止され、最も使用頻度が高く混色しても目立たない黒 頻度が高く混色しても目立たない黒色トナーのリサイク 色トナーのリサイクルが可能となる。

(エロー (Y) 、マゼンタ (M) 、シアン (C) 及び黒 色 (K) の頃に像形成手段を複数組中間転写体上に並列 に配置し、中間転写体上に転写材を搬送し、転写材上に 頃次トナー像を重ね合わせてカラートナー像を形成する [0050]上記図2ないし図4にて説明した構成は、 カラー画像形成装置やイエロー (A) 、 セゼンタ

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(M)、シアン(C)及び黒色(K)の順に像形成手段 頃次トナー像を重ね合わせた後、一括して転写材上に転 **写してカラートナー像を形成するカラー画像形成装置に** ついても同様とすることが可能であり、これにより前述 したと回様な効果、即も、中間航母体上の眠色トナーが 他の色の像担特体に付着することが防止され、最も使用 **しが可能となる。特にジャム時においても、中間転写体** 上の黒色のトナーが他の色の像担特体に付着することが 防止され、最も使用頻度が高く限色しても目立たない黒 を複数組中間転写体上に並列に配置し、中間転写体上に 頻度が高く混色しても目立たない黒色トナーのリサイク 色トナーのリサイクルが可能となる。

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ナーが他の色の像担特体に付着することが防止され、最

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下方に移動された定着装置17~と搬送され、定着ロー

[発明の効果] 本発明によれば、中間転写体上の黒色ト

[⊠ ⊠

11 スコロトロン帯転器 開光光学茶 4 d 2 [図1] 本発明にかかわるカラー画像形成装置の一実施 転写体上の黒色のトナーが他の色の像担特体に付着する 5使用頻度が高く混色しても目立たない開色トナーのリ サイクルが可能となる。斧にジャム時においても、中間 ことが防止され、最も使用頻度が高く混色しても目立た ない馬色トナーのリサイクルが可能となる。 形態を示す断面構成図である。 [図面の簡単な説明]

ペケト盤間回転軸ロール

紙分離AC除電器

费面配字器 原動ローラ

中国特別ペライ

配位器

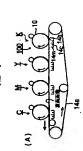
301,302,303 支持板 100 画像形成コニッ 190 トナー回収容器 19 クリーニング装置 17 定着装置 抽曲 9 5 1 4 k [図3] 中間転写体の離間と定着手段及び転写材案内手 [図2] 本発明にかかわるカラー画像形成装置における [図4] 転写材案内手段の移動の他の例を示す図であ 、ナー像形成状態を示す図である 段の移動とを示す図である。 (年号の説明)

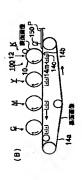
[図4]

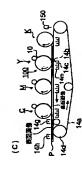
図]

P配級紙

10・ 戯光体ドラム







フロントページの統き

F ターム(参考) ZH028 BA05 BA16 ZH030 AA06 AA07 AB02 AD03 AD04 AD05 BB23 BB33 BB42 BB44 BB46 BB53 BB63 ZH034 AA02 BF01 BF07 CA00 CB00 ZH077 AA37 BA10 BB15 DB16 DB25 EA24 GA13

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